AMERICAN
DYESTUFF REPORTER

VOLUME XXIII JANUARY 1, 1934 NUMBER 1

Strength of Wool Yarn

In the Iso-Electric Region

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THE iso-electric point of a protein may be defined as the pH of a solution in which wool exhibits electrical properties which are equally positive and negative. At the iso-electric point, the electrophoretic velocity of particles of the protein is zero and most of its other properties such as osmotic pressure, swelling, viscosity, solubility, and combining power are at a minimum value.

The iso-electric point of wool, as determined by strength tests, is between pH 3.2 and 3.6. This result is in good agreement with previous determinations by other methods.

Speakman[1] observed that combination of the wool with the negative ferrocyanide ion began at pH 4.8 and increased with decrease in pH. Speakman considered that the iso-electric point of wool was pH 4.8, but it seems probable that the iso-electric point is not the point of zero reaction but of minimum net reaction, considering the adsorption of ions of both charges; in fact, Harris[5] has since shown that wool with an iso-electric point of 3.4 combines with negative ferrocyanide ions in solutions ranging in pH up to about pH 5.0 and with positive nickel ions in solutions ranging in pH down to pH 2.0. If we do not consider this value of 4.8, there is fairly good agreement as to the iso-electric point of wool.

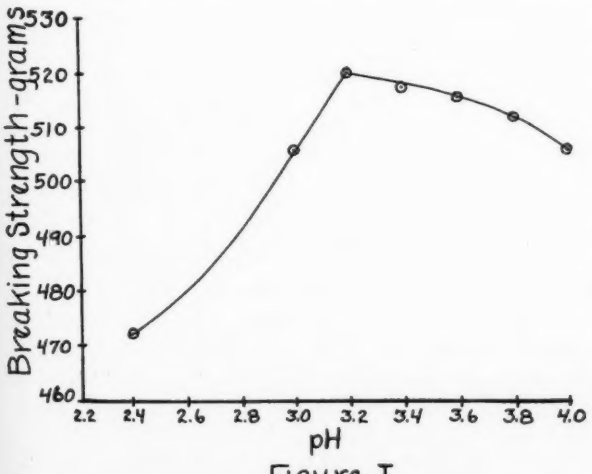

Figure I

Meunier and Rey[2] obtained the minimum swelling of wool fibers as pH 3.6 to 3.8. Marston[3] found the adsorption of acids by wool ceased at about 3.4. Harris[4], by electrophoretic measurements obtained the iso-electric points of three wools at pH 3.4. The last determination is probably the most accurate.

Since, at the iso-electric point, the swelling or solvation is a minimum, the surface of the fibers will be least gelatinous and slippery, so that if the yarn breaks by slippage of the fibers, the strength of the yarn should be a maximum at the iso-electric point. Also, the forces holding the fiber together sideways, whether primary valence forces due to cystine linkage or secondary valence forces, are under the least strain when least swollen, so that even if the individual fibers break, the breaking strength at the iso-electric point should be a maximum.

A skein of worsted yarn was reeled off and purified by extraction for six hours each with petroleum ether, alcohol, and water in the order given. Buffer solutions were made up to cover the range desired; McIlvaine's[6] standard buffer solutions were used. The skeins were cut in two and fourteen strands used in each test. The yarn was allowed to stand in the buffer solution for eighteen hours at 25°C ± 0.1°. At the end of eighteen hours, the yarns were tested while wet in a Scott single strand tester at 12 inches per minute and 8″ gauge length. The pH of the solution in contact with the yarn was determined in a Hellige pH apparatus.

The data obtained are given in Table I and are graphically shown in Figures I and II. Because of the com-

paratively large deviations from the mean, the probable errors were calculated and used in Figure II.

The data show that the iso-electric point of the wool is between pH 3.2 and 3.6 and probably between pH 3.2 and 3.4. These results are in good agreement with previous data as given above.

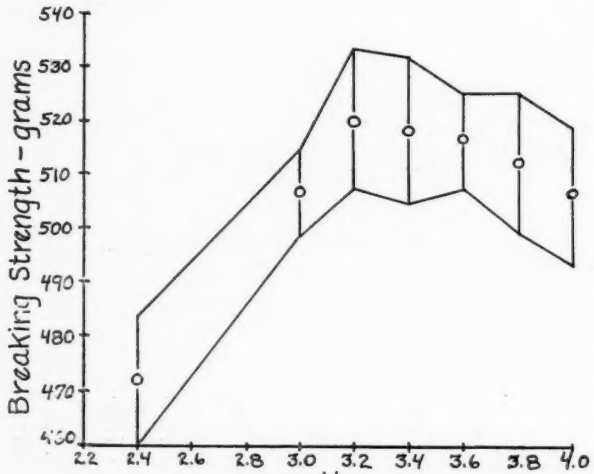

Figure II

TABLE I

pH	*Strength* —grams	*Probable error* —grams
2.4	472	12
3.0	506	8
3.2	520	13
3.4	518	14
3.6	516	9
3.8	512	13
4.0	506	13

[1] Speakman; J. Soc. Dyers and Colourists *41,* 172 (1925).
[2] Meunier and Rey; J. Soc. Leather Trades, Chemists *11,* 508 (1927).
[3] Marston; Council Sci. and Ind. Res., Australia Bull. *38,* (1928).
[4] Harris; Am. Dyestuff Rept. *21,* 399 (1932).
[5] Harris; Am. Dyestuff Rept. *22, 273* (1933).
[6] Hodgman; "Handbook of Chemistry and Physics," 17th edition, 681.

Publications on Dyes

Copies are available from the Bureau of Standards at Washington of a circular relating to dyes. It provides a list of all papers relating to dyes written by or in collaboration with members of the staff of the Bureau of Standards, including those appearing in non-governmental as well as in governmental publications. The papers are listed according to the date of publication. It starts from the year 1918 and continues to 1933.

New General Releases

The General Dyestuff Corporation has issued cards on the following products:

Fast Orange Salt RD—a new stable Diazo Salt which is placed on the market to complete the range of shades said to possess exceptional all around fastness properties. Combinations produced on Naptol AS, AS-OL and AS-RL ground in full shades produce brilliant oranges of reddish cast and are said to possess the same fastness properties as Indanthrene dyeings.

Variamine Blue Salt FG—a new stable Diazo compound representing an extremely valuable addition to the General range of Blues. In conjunction with Naptol AS-BS and AS-E it is said to surpass in brilliancy of shade and fastness to light all previous Naptol Blue combinations on the market.

Rapidazol Black B—a new product for printing, which like Rapidazol Blue IB is said to develop to a fast shade in rapid ageing. It does not require acid treatment like the Rapidogen or Rapid Fast Colors.

Celliton Fast Black GN Powder—said to represent a considerable improvement over the old "G" brand. It is also said to dye more level, exhaust well at lower temperature and not change under artificial light.

Solid Shades on Wool Acetate Silk Crepe Material—showing a number of fashionable shades for ladies dress goods dyed in uniform shades from a neutral Glauber's salt or soap Glauber's salt bath with combinations of neutral dyeing acid colors and Celliton Fast colors.

Indanthrene Dyestuffs on Rayon Hanks—a revised edition of the pattern card I.G. 33 giving a complete illustration of the general assortment of Indanthrenes.

Presentation of Perkin Medal

The Perkin Medal of the Society of Chemical Industry will be presented to Professor Colin G. Fink of Columbia University at a meeting to be held on January 5, 1934 at 7:30 P. M. at The Chemists' Club, 52 East 41st Street, New York City. This meeting will be held jointly with other chemical societies in New York. Professor Harold Hibbert of McGill University will give a short talk on the subject of the Medalist and his accomplishments and Prof. Marston T. Bogert of Columbia University will make the presentation. Dr. Fink will present an address entitled "Chemistry and Art." A dinner preceding the meeting will be held at The Chemists' Club at 6 o'clock. All interested are invited to attend the meeting, even if not members of one of the cooperating societies.

Interesting Booth

Considerable interest was shown in the booth of the Virginia Smelting Co. at the Chemical Exposition. Much attention was attracted by the motion pictures which were exhibited. These films illustrated the care and detail which attend the manufacture of Esotoo and also showed the actual application of this sulfur dioxide product in mill use.

The Scientific Aspect of Milling

By **A. J. HALL, B. Sc., F.I.C., F.T.I.**

(Specially Contributed)

Milling is an important operation in the processing of woolen and knitted wool materials in so far as it is widely carried out for the purpose of modifying their properties of handle, appearance and usability. In the following article milling practice is discussed with particular reference to the influence exerted by such fiber properties as length, fineness, scaliness, crimp, and elasticity; the optimum milling conditions are indicated. Modern milling theories are described.

ON the practical side it can be safely stated that the art of milling (felting) wool materials so they become denser and acquire increased warmth and a higher strength, has reached a high state of perfection. The man in the mill has mastered his craft. But it can scarcely be said that the scientist has been equally successful; he has not yet succeeded in discovering the physical-chemical principles which underlie the process of milling. A comparatively large number of investigations have been carried out, but, as yet, no commonly accepted theory has been put forward. Yet a complete understanding of the behavior of wool in the milling process would undoubtedly assist the processing of wool in directions other than milling, and for this reason it is considered opportune to bring together here the main facts which have been elucidated in connection with felting and milling.

In sharp contrast to the felting behavior of wool is the fact that other fibers such as cotton and rayon do not mill. So far as is at present known there is no simple method for causing a cotton fabric to become more compact without the use of chemicals which cause shrinkage. Thus in dealing with this distinctive property of wool, it is but natural that attention has been drawn to the fact that wool is composed of a nitrogeneous substance (keratin) and that each fiber is covered with overlapping scales in much the same manner as is a fish. In fact, the old-time explanation of the milling properties of wool is that the drawing of the fibers together during the milling process is due solely to interlocking of these projecting scales. Somehow or other it is difficult to reject this theory; it is very plausible until very carefully examined. Yet many facts are now known which suggest that the interlocking scale theory is only partially true.

It must not be overlooked that each wool fiber has a wavy character; each wave is frequently referred to as a crimp. Very fine wools have up to 30 crimps per inch but this number steadily decreases as the wool becomes coarser, so that the lower quality wools sometimes have as few a 6 crimps per inch. Just as twisted lengths of wire readily become entangled with each other, so it has been suspected that the crimps in wool fibers might well underlie the process of milling. It is not difficult to explain milling largely by reference to the crimps but this will be dealt with later.

A third theory of the milling processes suggests that the interlocking of the wool fibers may be largely brought about by the gelatinous character which they assume when immersed in an aqueous liquor which causes swelling. Probably the considerable swelling which does occur when a wool fiber is immersed in a warm soap or dilute acid liquor plays a part in the milling but it is difficult to believe that the fibers become sufficiently gelatinous to stick together.

Before discussing these theories further it will be useful to note a few facts concerned with the milling process. Firstly, it has been generally observed that the finer qualities of wool mill better than the coarser types, and to this must be added the fact that the finer fibers usually have more scales and crimps than the coarse fibers. Then comes the fact that real silk, although a nitrogeneous fiber and therefore similar in composition to wool, is free from crimps and scales and has no felting properties. Examination of the surface of a felted wool fabric reveals the fact that it is always the root ends of projecting fibers which are embedded in the fabric; it is the fiber tips which project freely. Within the fabric the individual wool fibers appear under microscopical examination, to be crossed and entangled with each other, and there is little evidence of interlocking of the scales. Schofield ("Cloth Finishing," 1927) has drawn attention to the fact that on a wool fiber the scales rarely project beyond 3 to 4% of the fiber diameter, and that in the finest merino wools such a projection is less than 1/2000th of an inch.

As regards the milling process itself, it has been found that while wool mills in water alone (preferably at about 40° C.) it mills much more rapidly and completely in slightly acid or alkaline liquors. On the large scale, soap liquors are generally employed, but there is evidence that acid milling liquors find considerable favor. Wool may be milled "in the grease" by using an alkaline liquor, it being obvious that in this process a certain amount of soap is formed by saponification of the grease.

The pH of the milling liquor is found to have a considerable influence on the ease with which a wool material felts. Also it may be noted that after chlorination (a process in which wool fibers tend to lose their scales) wool mills only with difficulty, and that if the chlorination is sufficiently severe nearly all of the scales are removed and the wool does not mill at all. Finally it is a known fact that if wool fibers are jostled together each fiber tends to move in the direction of its root end. The presence of the scales obviously contributes to this unidirectional freedom of movement, and it must play an important part in milling operations.

Having outlined some of the main facts which have been observed in connection with the milling process it will be useful to consider somewhat in detail the following properties of a wool fiber which may influence milling and indicate the extent to which various investigations have shown these properties to be influential during milling. After that it will be possible to state the milling theory which is in most accord with present-day knowledge.

The following properties of wool deserve consideration in connection with milling:

1. Fiber dimensions and form:
   (a) Fiber length.
   (b) Fiber diameter.
   (c) Fiber crimp.
2. Scaliness.
3. Elasticity.
4. Swelling in aqueous liquors.

1. Fiber Dimensions and Form

The dimensions and form of a wool fiber are usually intimately connected so that it is somewhat difficult to ascertain exactly their separate effects. Thus a fine fiber is usually comparatively short, while coarseness is associated with long fibers. In much the same manner, fine fibers are more scaly than coarse ones, and crimps are usually more numerous in the finer fibers. The following data ("Structure of the Wool Fiber," Bowman) are of interest in this connection:

Type of Wool	*Diam. of Fiber*	*Scales per Inch*
East Indian	0.00143 inch	1000
Lincoln	0.00091	1000
Southdown	0.00080	1500
Merino	0.00055	2000
Saxony	0.00050	2200
Type of Wool	*Diam. of Fiber*	*Crimps per Inch*
English Merino ...	0.00064 inch	30–34
Southdown	0.00078	13–18
Southdown	0.00100	11-16
Irish	0.00120	7–11
Lincoln	0.00154	3–5
Northumberland ..	0.00172	2–4

The effect of fiber length in milling has been investigated by Speakman, Stott, and Chang (J. Text. Inst., 1933, *24*, 274). A Wensleydale top of wool having an average fiber length of 13.1 cms. was selected, one part being cut by hand to a shorter fiber length of 5.5 cms. and again converted into a top. The top of long fiber wool was then made into 1/4.6's yarn having five turns per inch, while the top of short fiber wool was made into yarns having the same count but with 4.8 and 7.3 turns per inch. These three yarns were then woven into similar fabrics which were milled together in the fulling stocks and the rates of shrinkage noted. In this manner the following results were obtained:

Wool	*Count of Yarns*	*Twist (Turns/Inch)*	*Shrinkage in Area in 4 Hours Milling*
Long fiber length.	1/4.60	5.0	13.4%
Short fiber length.	1/4.75	4.8	7.6
Short fiber length.	1/4.78	7.3	5.3

A long fiber length thus favors milling, and Speakman notes that it is probably the long fiber length of a coarse Wensleydale wool which, in spite of its inferior scaliness, gives it superior milling properties to the shorter and more scaly Southdown wools.

No direct evidence appears to be available with regard to the direct influence of crimp on milling, but it would seem likely that the greater the amount of crimp the more susceptible will be the wool to milling.

2. Scaliness

In spite of the tendency of modern technologists to abandon the interlocking of scales as the prime cause of milling, it is almost impossible to explain milling without reference to scaliness of a wool fiber. Scales have the effect of increasing the friction between wool fibers when rubbed together with their scales pointing in opposite directions, and this must influence the direction in which wool fibers move relatively to each other when jostled together. As a result of this friction difference, according as to whether the scales of adjacent fibers are pointing the same or in opposite directions, wool fibers tend to move in the direction of the root ends. Thus under the influence of milling conditions a wool material will tend to shrink.

On the sheep's back there is little or no tendency for the wool fibers to mill together although exposed to conditions resembling those which exist in milling processes. It would therefore appear that milling does not occur when the wool fibers are aligned so that their scales point in the same direction while the root ends are not free. Milling appears to proceed always from the root end of the wool fiber, and it is useful to note an experiment carried out by Fiske (Textile World, 1919, July, 26th) on locks of wool carefully cut from the fleece and scoured so that the fibers were not disarranged. Two locks of wool were cut from the root end of this scoured material and wrapped together in cotton fabric; two further locks cut from the tip end were similarly wrapped. The two bundles were then milled and afterwards examined, it being found that the root ends of the fibers were felted together but not the tip ends.

(Continued on page 27)

PROCEEDINGS OF THE
American Association of Textile Chemists and Colorists

JANUARY 1, 1934

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Annual Meeting

December Meeting, New York Section

THE Annual Meeting of the parent body of the Association was held jointly with the regular monthly meeting of the New York Section of the Association Friday evening, December 8, 1933, at eight-fifteen o'clock, at the Chemists' Club, 52 East 41st Street, New York City, Henry F. Herrmann, Chairman of the New York Section, presiding.

Chairman Herrmann: Mr. President and Officers of the American Association, our Guests of Honor, and Fellow Members: It gives me very great pleasure to announce the opening of this meeting which takes the place both of the Annual Meeting, which would ordinarily have been held at this time, as well as the regular November meeting of the New York Section which has been postponed until this date.

In the interest of economy of time, it is our plan to omit the ordinary routine business which would ordinarily be conducted by the New York Section. We will therefore dispense with the reading of the minutes as well as committee reports and we will proceed immediately to the technical portion of our program.

As you know, gentlemen, the Metropolitan District which includes a radius of about thirty miles around New York constitutes the silk capital of the United States. In greeting our distinguished visitors from out of town, from up East and down South, it seemed only fitting to us that the subject selected for discussion on this occasion should be one that is closest to our hearts. In casting about for someone to handle this subject as we would like to have it handled we were favored by having an entree to the very top ranks and the speaker we have with us tonight comes to us, I am sure, prepared to tell us whatever policy permits him to on this very important subject.

I take great pleasure in introducing to you Mr. Paolino Gerli. You will find his connections in your program. He is the Vice-President of E. Gerli & Co., Inc. He was formerly President of the Silk Association and is today the President of the International Silk Guild, Inc. He has just returned from Europe where he attended some conferences on the subject closest to his heart and which, for this evening anyway, constitutes our main interest.

Gentlemen, it gives me great pleasure and I take great honor in presenting to you Mr. Gerli. (Applause.)

Proceedings of the American Association of Textile Chemists and Colorists

The Promotion of Silk

In Relation to Chemistry, Dyeing and Finishing*

By **PAOLINO GERLI**
President, International Silk Guild, Inc.

MR. CHAIRMAN, Officers of the Institute, Members and Guests: Indeed I consider it a great honor to have been called upon to address you this evening upon the subject which your Chairman referred to, a subject which is, as he quite correctly stated, very close to my heart because of my family tradition and upbringing, you might say, almost from childhood.

With me, it has gotten beyond the point of being a matter of defending something for profit or rather with the thought that its defense might lead to profit. It is sentimental to a great extent, I wish to assure you.

I must tell you very frankly that I have just returned from Europe and that this engagement was made for me while I was absent and I only found out about it after the engagement had definitely been made. As a matter of fact I was quite apprehensive because the indications were so terrifying but I consoled myself at first in the belief that a misprint had occurred and eventually, when I learned that that was not the case, I rushed into a little conference with myself to see where I could possibly fit in. Then, when I did find out who you were—that in actuality you were the partners of the raw silk man and had been for ever so long—I felt very much pleased and decidedly happy. When I say "partners," I say so advisedly because the Lord knows we have been selling what you have been making for a long time. Rather, we have been selling what you have been putting into what we make for a long time, as the thing that we make (laughter), and not entirely unprofitable at certain times because silk as you know at times has been pretty valuable. It isn't today and has not been for a couple of years but at one time it was extremely valuable. It suffices to remind you that in 1920 we were up to eighteen dollars a pound. Just think of it! Is there anything as costly today—outside of gold, I mean?

It was a mighty fortunate thing at the time that you folks stepped into the picture to help us out. Otherwise, I don't know who would have been able to use silk. So we owe to dyers and printers a great debt of gratitude. At least, we owe it to you up to the point where the pressure of your clients got you off the right track and you allowed yourselves to be swayed into the belief that what you were contributing to our industry was really the product of the metal market, and the Lord knows it was not, as some of our good friends here have been telling me for a long time and most likely have been telling you also.

However, the fact remains that you have made—I mean this seriously now—real contributions to the development of the silk industry in this country and I doubt that it could have developed as much as it did had it not been for your help.

However, gentlemen, you are a bit fickle, too. Wrapped up in your problems, wrapped up in your science, you apply your real scientific viewpoint to things and when a problem presents itself you just seem not to care—and I don't blame you for it; I think it is quite proper—what you are trying to foster or help along.

It so happens that you have done some mighty marvelous things for somebody else. (Laughter.) We don't blame you for it. We admire you for what you have done. Lord forbid, however, that your knowledge, your skill, and your science should go any farther in that direction. (Laughter.)

I repeat that, sentimentally, I am a silk man. I was born into the industry and have been reared in it you might say from infancy. You know in Italy they send us out with wet nurses shortly after we are born and I have been told that I played in the barnyard with pigs and fowl and also with the silkworm which as you know is raised in those surroundings.

So that, because of this training, through these connections, and perhaps because of the interest which it has been my good fortune to take in the development of this industry in the last twenty-eight years, I have sort of acquired a decided silk mind which cannot conceive of anything else in so far as main interest is concerned but is still fair enough to recognize worth and beauty in other things.

*Presented at N. Y. Meeting, Dec. 8, 1933.

Gentlemen, the great effort which we are trying to make and the progress and program which will be shortly announced to the trade is tied up with the comparatively recent formation of the International Silk Guild. The International Silk Guild was formed because we felt that the time had come—if any thing I might say it has been long delayed, but definitely the time has come now—when we could not delay any further the work which in Europe they call "propaganda." We hate to use that word here because somehow or other propaganda seems to be tied up with politics and things which have left a bad taste in the mouth and in the minds of people.

It is a promotional effort which we intend to make. It is not so much the bringing back of the predominance of our fiber in the field of textiles and in the field of style, as it is an effort to take advantage of an innate feeling, of an innate consciousness which I find widespread throughout the world in favor of silk in the minds of people in general.

This feeling does exist and I say that it exists throughout the world because I have traveled throughout the world and I have made it my business to talk to people not only in the silk business and all its related branches, but to people outside of the business entirely, people in just plain, everyday, human society.

Silk is not something new to people. They needn't be in the business, they needn't know the chemical composition of silk or the factors that go into the production of silk. They know that silk is something that they heard their mother, their grandmother, or their aunt, or someone else in the family describe as being something of beauty and something desirable, something to crave for, something to desire, and something to acquire. We unquestionably have that great advantage and it is that particular feeling that we want to exploit, if I may use the word, and bring out in the consciousness of the people.

The fact that it does exist should not be held against us. After all, there are mighty few things that have the history and the background of silk. In one sense it is the very ancestry of silk that has brought about—I won't say its downfall by any means—I would say its relegation to a corner, because of the marvelous advances of the new fibers which have come upon the market in the last few years.

I attended the Silk Conference in Paris with the idea of seeing what our European friends had done and intended to do, with the idea of seeing where we could fit into their picture, where we could cooperate with them, and how we could make this effort an international and world-wide one. There is no question that our French friends have a decided flair for matters of this character. We do recognize them, and rightly so, for their *savoir-faire*, for their taste, and for their art. It seems to be native to them. I was amazed really to find that they had gone pretty much on the way in the type of campaign that we might readily adopt, ourselves, in this country as the main purpose of the International Silk Guild.

We fully realize that any effort at promotion of silk would be entirely futile and would miss its mark if it were to be only along the generally accepted lines of publicity in magazines and newspapers, the radio, etc. We realize that there are things within the industry which must be set right first before we can even proceed to any other effort.

Because of this ancestry of silk, which I referred to, we have sort of lulled ourselves into a feeling of security which I have just told you has been in a sense our very weakness and we have allowed things to creep into the trade which have been extremely detrimental. We have allowed things to creep into the trade which, it has been pointed out to us time and again, have created disfavor in the eye of the converter, in the eye of the cutter, the dressmaker, the retailer, and finally the public, which have created a dislike even among you who are possibly our best friends.

Is it cupidity or it is the force of circumstances? I am not here to judge but the fact is that in the handling of silk we have allowed ourselves to manipulate it in a manner which detracted from what it is and what it should stand for.

It will therefore be one of our first efforts to bring back to our people the sense of responsibility which they have to the trade with which they are connected and which they must of necessity, if they wish to be successful, themselves, convey to the ultimate consumer.

One of our first efforts and one that we will pursue very actively and quite directly will be the establishment of a definite trademark for silk with a definite interpretation as to what silk is and what shall be called silk, going to the extent of trying to have it incorporated into the laws of the country. That, however, being a rather slow and lengthy process we will try to hasten it along by a self-imposed law, the adoption of which we will try to force by every means upon the trade.

I am using rather decisive language in this respect but I feel that we have come to the point where that is what we must do. History has shown us in the last few years, in many, many different ways—morally, politically, and otherwise—that things may get to a point where you just have to take the law into your own hands, and that is the point we have reached in the silk business.

In the establishment of this trademark with the definitions which we will also establish, we hope to have the cooperation of your Society. I have reference to the weighting limits, and to the description of what is a pure dye article.

Europe in that respect is further advanced than we are. Italy definitely passed a law a year and a half ago in connection with this particular point, settling limits for

the weighting of silk, establishing what may be called silk and what can only be called silk, with a definition on the article itself as to what the adulteration is. In France they are now proposing, and the bill will be introduced in the present Chamber of Deputies, for somewhat the same definition. We will work along the same lines here but as I say here we can go a little faster than they have in that respect in that we will try not to wait for the law but we will try to make it self-imposed. In other words, we are going to try to shame our manufacturers into doing the right thing. If you will just help along by refusing to go beyond the limits which as I say we will try to establish in consultation with you, it will be so much gained for us, and I honestly believe it will be so much gained also for the industry which you represent.

In this connection, I feel that one of the things that our Guild will have to do, and do with the greatest of pleasure, if you will permit us, Mr. President, is to establish one or more fellowships within your institution for the study of dyeing and finishing as applied to silk, for the enhancing and beautifying of our article, for the making of this article more wearable, if possible, more presentable, and therefore more desirable. (Applause.)

I was pleased this evening to be introduced to men whom I knew by name and who represent the field of retailing. Their efforts stand out as a decided contribution. The work of the National Retail Dry Goods Association, whose work I have followed, both as President of the Silk Association and because of my interest in silk, and because of the fact that they have often come to us with their problems, on which we have not been able to help so far but on which we will certainly try to help from now on, is of an outstanding character and of tremendous help. I know that they have worked with you and collaborated with you. And I know that in so far as you are concerned I can't imagine—I will put it this way—that you would want to do anything else but cooperate with them and listen to what they have to say because, after all, they bring back to you the voice of the public, the final consumer, and they know just how far you can go—and it is a darn good measurement to have. While they may perhaps not know all that can be done or all that cannot be done, nevertheless it certainly would pay us and I think it would pay you to listen mighty carefully to what they have to say.

As far as our Guild is concerned, I know that we will welcome any contribution of that character that they can make and I had the pleasure of so telling the officers of the National Retail Dry Goods Association today.

I hope you will believe in the sincerity which we want to bring to our problem—and that is a selfish interest—and the sincerity, which I hope to leave with you, as to my own feelings and the feelings of my associates in the Silk Guild, that we would be grateful to you for whatever contribution you can make to us. But as against that you will find in us ready cooperators, the type of partners that I alluded to before somewhat jokingly, but nevertheless seriously, and I hope and trust that your very prosperity, the enhancement of your reputation, and of your Association will perhaps reflect in a small way the little grain of help that we may possibly bring to it.

I thank you very much for the opportunity, Mr. Chairman and gentlemen of this Association, of appearing before you. I am very proud to have been here. I hope you will pardon my poor efforts but that you will believe they are very sincere. I trust you will believe in the very sincere feeling which I carry in my own heart and that some results will be had from this effort which we have set ourselves to accomplish for silk. (Applause.)

Discussion

Chairman Herrmann: Mr. Gerli, I am sure that the members of this Association agree with me that nothing is as eloquent as a heart which is full of a subject, and a tongue which is sincere, and we sincerely appreciate your presentation of a subject that is so close to you and which we feel is also close to us, not only in a personal sense but also in a business sense. We deeply appreciate your coming here and thank you for this message. We wish you godspeed not only personally but for the venture on which you have embarked.

Our President has signified his desire to thank you personally and to answer some of your remarks. And for those of our members and friends with whom the next speaker is not personally acquainted, it gives me the greatest honor and pleasure to present to you Dr. Rose, our National President. (The members arose and applauded.)

President Rose: Mr. Chairman, Mr. Gerli, and Gentlemen: I have never heard a presentation that seemed to me so much a challenge as this address of Mr. Gerli's. He has taken us into his confidence and has asked us to show him that we are what we profess to be—those who know more about textile fibers than anybody else.

I want to assure him in the name of the Association that he has not asked us to embark on this crusade in vain and that the resourcefulness of every member of the Association that can be called into play to help the International Guild to solve their very serious problems will be available and will be made active on behalf of this movement.

Gentlemen, let me remind you that silk, after all, does really stand apart. It stands in a class entirely by itself. Even the manner in which Nature uses this fiber sets it apart from the others.

Cotton is nothing but a parachute to carry the seed some distance from the place where the parent plant has produced it. Wool is nothing but an overcoat to keep the sheep from getting unpleasantly chilly. But when it comes to the shroud of the living moth, one of the most beautiful things in Nature, Nature has chosen silk. And I think that if we will look into the history of silk as a

natural product we will dimly feel the potentialities that the human race has not yet realized in this fiber.

Silk is very closely akin to the skeletal matter of the insect, the chitin, which is so extraordinarily flexible, so beautiful a product, that an insect when it casts its skin moves out and leaves a perfect image of itself, moving out every little piece, every little part; a plastic such as we have not yet equalled.

I don't know whether any of you as boys were interested in collecting insects. I was and I am very glad I was. I remember one of the scenes which I witnessed that impressed me perhaps more than any other. It brings home to one the poetry of the possibilities in a tissue.

Have you ever seen the nymph of the dragon-fly, the dull, drab, blind-eyed creature with foolish little wing cases that don't expand, with an ugly jaw that is very effective in catching prey but is not a thing of beauty, feel the impulse that leads it to find new uses for what is within its body, the impulse that leads it from the water up the straw that supports it into the air? Have you seen it rest, perfectly still, and wait for the transformation that is to come? Have you seen the skin split and seen a soft, poor thing but, even as it emerges, a thing that glitters come from that shell? And then have you watched it as, little by little, the small traces of wings have spread, have grown larger, have shown the beautiful veining that is on them, that gives the insect its name, the nerve wing? And have you seen those wings stiffen until suddenly when the time was ripe, the insect dropped into the air and floated on the glistening silk that before was merely a product hidden in the nymph?

I should like to feel that we may help silk to realize its place as the wings of art in making what is beautiful available to the human race, and in that spirit I pledge you, Mr. Gerli, our support. (Applause.)

Chairman Herrmann: Gentlemen, we have quite a program before us and for that reason we are going to dispense with all formalities and with all routine business, as I said before, and having presented Mr. Gerli as our speaker of the evening and with this very inspiring acknowledgment by our President, I declare the session of the New York Section for this occasion closed.

I now take pleasure in turning the meeting over to our National President for the conduct of the Annual Meeting of this Association.

. . . Dr. Rose assumed the Chair . . .

ANNUAL MEETING REPORTS

President Rose: As you know, gentlemen, this year the Annual Meeting which the Constitution requires us to hold at this time has been divorced from the usual technical program which we have had in the past, the technical program having been arranged for at the Chicago Convention. We have then before us essentially a business meeting, and no more than a business meeting.

The first order of business is the Secretary's Report and the Treasurer's report and I would ask our Secretary to present his.

. . . Secretary Graves presented his prepared report . . .

Secretary's Report
November 1, 1932, to November 1, 1933

Since November 1, 1932, the Council and Research Committee have each had eight meetings as follows:

Nov. 4, 1932, at the Chemists' Club, New York, N. Y.
Dec. 2, 1932, at the King Cotton Hotel, Greensboro, N. C.
Jan. 27, 1933, at the Chemists' Club, New York, N. Y.
Mar. 31, 1933, at the Bureau of Standards, Washington, D. C.
April 28, 1933, at the Chemists' Club, New York, N. Y.
June 23, 1933, at the Engineers' Club, Boston, Mass.
Sept. 8, 1933, at the Congress Hotel, Chicago, Ill.
Oct. 27, 1933, at the Engineers' Club, Boston, Mass.

Members were elected as follows:

Active	92
Junior	26
Student	22
Associate	25
Corporate	2
	167

or 38 more than the previous year.

There were the following suspensions because of non-payment of dues:

Active	116
Junior	24
Student	19
Associate	9
Corporate	2
	170

or 13 more than the previous year.

Resignations were as follows:

Active	12
Junior	4
Student	1
Associate	5
Corporate	1
	23

or 12 more than the previous year.

The membership at present is made up as follows:

Active	1,011
Junior	107
Student	36
Associate	77
Corporate	28
	1,259

During the year two new classes of membership were formed. These are known as Life membership and Sustaining membership.

Several changes have been made to the Constitution.

The Research Program was continued by our three Research Associates and with the aid of an additional grant from the Textile Foundation, the Committee was able to secure the services of a fourth Research Associate.

It is with deep regret that I find it necessary to retire from the position of Secretary. It has been a great pleasure to work with the Council and Research Committee.

Respectfully submitted,

A. NEWTON GRAVES,
Secretary

President Rose: Gentlemen, you have heard the report of the Secretary. In presenting it to you, I can only say that we owe our Secretary a debt of gratitude for the very painstaking way in which he has attended to the duties which have taken up a great deal of his own personal time and into which he has put a great deal of effort in more ways than you would suspect. The Secretary's position is always one that is most necessary and most exacting.

What is your pleasure with this report?

. . . Upon motion duly made and seconded it was voted that the report be accepted as read . . .

President Rose: We will now have the Treasurer's report, please.

. . . The report of the Treasurer was presented . . .

Treasurer's Report

October 31, 1933

GENERAL FUND

Cash on hand last Report—October 27, 1933..	$7,365.25
Receipts—October 27, 1933, to October 31, 1933	160.23
	$7,525.48
Expenditures—October 27, 1933, to October 31, 1933	$128.86
Balance—October 31, 1933	$7,396.62

RESEARCH FUND

Cash on hand last Report—October 27, 1933..	$2,520.75
Receipts—October 27, 1933, to October 31, 1933	.....
	$2,520.75
Expenditures—October 27, 1933, to October 31, 1933	$902.77
Balance—October 31, 1933	$1,617.98

BANK BALANCE

OCTOBER 31, 1933

General Fund		$7,396.62
Research Fund		1,617.98
		$9,014.60
First National Bank—Savings Account		$6,536.43
First National Bank—Checking Account (October Bank Statement)		3,509.56
Less—Outstanding Checks:		
Voucher No. 464	$150.00	
Voucher No. 465	233.34	
Voucher No. 466	250.00	
Voucher No. 467	175.00	
Voucher No. 468	5.45	
Voucher No. 469	88.98	
Voucher No. 470	84.12	
Voucher No. 471	5.50	
Voucher No. 472	39.00	
		$1,031.39
		$9,014.60

Statement of Cash Position:

	General	*Research*	*Total*
Cash on Hand—November 1, 1932..	$6,397.20	$2,102.82	$8,499.02
Cash on Hand—November 1, 1933..	7,396.62	1,617.98	9,014.60

Respectfully submitted,

W. R. MOORHOUSE,
Treasurer

President Rose: Gentlemen, we have heard the report of the Treasurer.

I think you will all agree that for what we do we expend really very little. That is the only comment that I make upon this report. Any other association of which I know asks its members to contribute more heavily than does this for anything like the same amount of output and I think that we have shown very considerable wisdom in doing one thing that saves us a great deal of money, and that is in continuing to make our proceedings a part of the DYESTUFF REPORTER. The cost of a journal, if we were to endeavor to carry it alone, would force us at once to raise our dues or to curtail our research so seriously that our research program would be insignificant.

In this connection, I want to ask you here to do all that you can to bring the membership to an understanding that the very lifeblood of the Association is research, that we are always judged by our contribution in that field. We are very fortunate in being able to make our money go a great way because we are able to oversee, in a sense, research that is paid for by the Textile Foundation. But that does not take from us the duty of carrying on a

certain amount of research ourselves as evidence of life on our own part. It was because of this that the Council brought up the sustaining membership, which the Association passed upon, and that sustaining membership is no mere gesture. It as absolutely essential that a considerable number of our members should feel that they are justified in supporting the research program, if we are not to find that our reserves are eaten into very seriously.

You just heard Mr. Moorehouse state that the forecast was for a deficit of over two thousand dollars, which was avoided merely by the fact that we didn't spend some money that should have been spent. Next year we face more of a deficit than ever.

In that connection, I want you all as members of the Association to feel perfectly free to do all that you can to make the Research Committee responsive to what you feel the Association had best carry out in the way of research. Research is such an enormous field, it is such an extensive field, that there are many ways of doing it and we, of course, being human, can only do what we can to the best of our judgment. At present, if anything, there is too much reliance placed upon the few men who have its direction in hand though the membership at large is inclined to criticize the expenditure without realizing precisely what return they get on it.

I should like you to be very frank in such criticisms but I should like you to make them only after you have taken the trouble to see what that research means.

I think we can congratulate the Association on the fact that the treasury is in such a good position. Every other learned society of which I know is in a very much worse position than this and I certainly hope that by our own efforts we will not find that next year we are relatively in a poorer position.

Are there any further comments on the report of the Treasurer?

. . . Upon motion duly made and seconded, it was voted that the report of the Treasurer be accepted . . .

President Rose: We come now to the election of officers and I have asked Mr. Zillessen and Mr. Lawson to act as tellers. They have counted the votes and the results are in the hands of the Secretary who will now read them to us.

Election Results

For President—Robert E. Rose	308 votes
For Vice-President—Alex Morrison	306 votes
A. R. Thompson, Jr.	303 votes
Harold Schroeder	1 vote
Robert Bruce	1 vote
For Treasurer—W. R. Moorehouse	309 votes
For Secretary—H. C. Chapin	308 votes
A. Newton Graves	1 vote

The two Councilors-at-Large for three years elected are:
Joseph F. X Harold. Donald H. Powers.

President Rose: I have now the pleasure of succeeding myself in office and I want at this moment to thank the members of the Association for their confidence in me. It is true that the ballot when it goes out finally looks as though there were no choice, but actually the Constitution reads in such a way that any member who can find ten friends to put up his name, and does so in time, can be put upon the ballot. Therefore I must feel that those of us who have been elected have received a vote of confidence on the part of the Association, and not merely that of the Nominating Committee. (Laughter.)

At this time I feel that I should like to thank Mr. Graves, who most unfortunately finds it impossible to continue in office, as he has told us, for his services and I take very great pleasure in presenting to him a token of our appreciation, a token which is in no sense a reward that measures his services but merely a gesture on our part to show him that we should like to give him a great deal more. But we give him what we can because we appreciate what he has done for us.

I have here a little box and within that I have a small billfold, and within the small billfold—unfortunately I didn't have time to get in touch with our Treasurer—there is merely a promissory note on the part of the Association that our Secretary will receive a sum of money which we hope that he will devote to something that will remind him of our gratitude for what he has done. (Applause.)

The Council at the time we deliberated this action felt that it was only fair to consider that our previous Secretary, Mr. Morrison, did all in his power to further the interest of the Association and that to him also we owed a debt of gratitude which we had entirely omitted to pay. Therefore, it is with great pleasure that I take another little billfold from this little box, and ask Mr. Alex. Morrison to take our I.O.U. for the sum which we will present to him as a token of our gratitude. (Applause.)

Mr. Morrison: Well, Mr. President and Fellow-Members, I certainly appreciate this. It is better late than never. (Laughter.) But it certainly is very nice of you to do this. I also appreciate the confidence you have placed in me by again electing me a Vice-President. I shall certainly endeavor to carry on to the best of my ability. (Applause.)

President Rose: Where is my new Secretary? I am lost without a Secretary. (The members arose and applauded as Dr. Chapin came forward.)

The next order of business is reports of committees. The most important by far of the committees which we have is the Research Committee, of which Professor Olney is Chairman. I wall ask Professor Olney to present the report of that Committee.

(Report of the Research Committee will be published in the next issue).

Proceedings of the American Association of Textile Chemists and Colorists

Rate of Absorption and Affinity at Different Temperatures of Substantive Dyestuffs When Applied to Cotton and Rayon*

By C. A. SEIBERT
E. I. du Pont de Nemours & Co., Inc.

(Continued from page (387) 969, December 18, 1933)

COTTON

Procedure to Determine This Rate

Material used: 10 gram skeins of 28/2 unbleached cotton.

Previous to use, the skeins were treated for 2 hours at a gentle boil in a bath containing, per 100 lbs. cotton, 5 lbs. soda ash (58%) and 2 lbs. Monopol oil (75% double sulfonated castor oil), followed by a thorough rinsing in warm and cold waters and entered into the dyebaths wet, but with the excess water removed.

Proportion of dye liquor to material: 20 to 1; 10 grams in 200 cc. Permutit water of 6.8 to 7.6 pH was used.

Dyestuff and Assistants Used	*Per* 100 *Lbs. Cotton*	*Per* 10 *Grams*
Dyestuff	1 lb.	0.1 gram
Common salt	10 lbs.	1.0 gram

(Sodium chloride. A good grade of commercial quality.)

Absorption rate dyeings.

Preparation of the Dyebaths

1 gram of the dyestuff was dissolved in hot water and made up to a volume of 900 cc. with warm water, and 100 cc. of a 10% solution of the salt added.

100 cc. of this solution were pipetted into a porcelain beakers of 250 cc. capactiy and 100 cc. of hot water added to each, making the total volume 200 cc.

The beakers were then placed in a boiling water bath and when the temperature within the beakers had reached 180° F. a skein of cotton, suspended on a glass rod, was entered and turned continuously for 2 minutes.

The skein from one of the baths was then removed, rinsed in cold water, passed between rubber rolls to remove excess water, and then dried in a hot air oven at 160-175° F.

In the interval, the skeins in the remaining baths were kept under the liquor and turned at 3 to 5 minute intervals until removed.

One of the remaining skeins was removed at the expiration of 5, 15, 30 and 45 minutes and rinsed and dried as described.

As the temperature of the cotton skeins is 70-80° F., when entered into the dyebaths, the temperature within the baths is lowered to an average of 170° F., and requires an average of 6 minutes to again reach 180° F. The continuous turning and exposure of the skeins during the first 2 minutes also reduces the temperature within the dyebaths, but after it again reaches 180° F. or above, the subsequent turning of the skeins does not lower it perceptibly. Attention is directed to this fact to indicate that the 2 and 5 minute rate figures refer to a dyeing temperature of approximately 170° F. and not 180°-190° F. However, this would be comparable with conditions which exist in practical application except perhaps in a few instances in closed machines of the circulating liquor type, but these would represent exceptions and not general procedure.

Standard Strength Dyeings

From the remaining portion of the dyestuff solution, the following quantities were pipetted into porcelain beakers: 20, 40, 60, 80, 100 cc. and greater quantities if required to determine the correct strength relation of the dyeings made for the varying periods of time and at varying temperatures. Sufficient hot water was then added to bring the volume of each to 200 cc. A 10-gram skein of cotton, suspended on a glass rod, was then entered into each, the beakers placed into boiling water baths, and the dyeing continued for a period of 45 minutes after the temperature within the beakers had reached 185° F. During the entire dyeing period the skeins were turned, as required, to assist a uniform absorption of the dyestuff, and between the turnings were kept under the liquor. After dyeing, the skeins were rinsed, squeezed and dried as described.

Determining the Rate of Absorption

The standard strength dyeings are considered to represent 20, 40, 60, 80, 100%, etc., of the total strength obtained from 1 lb. of the dyestuff when normally applied to 100 lbs. of cotton.

The dyeings made for the different periods of time were compared with the standard strength dyeings and the results tabulated on the basis of their strength compared with the standard strength dyeings. As an illustration, the rate for Pontamine Diazo Yellow 2GL is given as 75% for 2 minutes, which indicates that 75% of all the dyestuff that is taken from the dyebath in 45 minutes is absorbed in the first 2 minutes that the cotton is in the bath. The rate for 5 minutes is given as 85% which indicates that 85% of all the dyestuff that the cotton absorbs in 45 minutes is taken up during the first 5 minutes of the dyeing operation.

This tabulation indicates the rate at which the individual dyestuffs are absorbed under definite and distinct conditions. If any one of these conditions is altered the relative rates may also be distinctly altered. As illustrations: the rate may be expected to increase when less dyestuff is used and decrease when more is used. It will also change if more or less salt is used, or soda ash, and may if any wetting or penetrating assistant is used. The presence of metals also affects the rate as does temperature change, as indicated by the tabulation describing the affinity at different temperatures.

Affinity at Different Temperatures

The dyebaths were prepared exactly as described for the absorption rate dyeings. Three of the beakers were then placed in water baths and the contents heated to the temperature stated at the head of each column in the tabulation. A skein of cotton was then entered into each and treated for 45 minutes. During this period, the temperatures within the beakers were maintained within 5° F. plus or minus that mentioned in the tabulation, and the skeins turned at intervals and between turnings, kept under the liquor. The dyeing in the fourth beaker was made at room temperature, 70°-80° F.

After dyeing, all the skeins were rinsed, squeezed, and dried as described.

Tabulation of the Results

The figures in the tabulation describe in percentage the strengths of the dyeings made at the temperatures indicated in relation to the dyeings made at 180-190° F. which are designated, the standard strength dyeing.

RATE OF ABSORPTION WHEN APPLIED TO RAYON

In a separate tabulation appended, the absorption rate and affinity at different temperatures of this group of dyestuffs when applied to rayon is indicated.

150 denier, 28 filament Du Pont rayon was used for these dyeings and entered into the dyebath wet, after a thorough scouring and rinsing.

The dyebaths were prepared exactly as described for the cotton dyeings except only one-half as much dyestuff was used and the common salt was replaced by an equal quantity of Glauber's salt crystals; the proportion of dye liquor to material was 40 to 1; 5 grams of rayon were dyed in a volume of 200 cc.; and the absorption rate and standard strength dyeings were made at 180°-190° F., the latter for 45 minutes.

In the tabulation giving the affinity at different temperatures, a fifth dyeing was included to indicate the affinity without the addition of Glauber's salt to the dyebath. This dyeing was made for 45 minutes.

The results were determined and are described using the same system as for the cotton, and the remarks pertaining to the influence exerted by the various factors mentioned in relation to the cotton dyeings also apply to the rayon dyeings.

(Tables appear on following pages.)

UNEMPLOYMENT REGISTER

(Continued from page (20) 24)

Experience—Eleven years experience as chemist and boss dyer on the following: woolen, worsted and cotton yarn; woolen, worsted and union piece dyes on both ladies' and men's wear; wool, cotton, shoddy and mohair raw stock. Age 33, married, will go anywhere. References.

B-9

Experience—Hosiery dyer with fifteen years' experience on high grade silk hosiery; familiar with all types of machines. Age 43, married. Will go anywhere. References furnished.

B-10

Experience—Ten years in top dyeing for fancy men's wear trade, knitting trade and sports wear; also piece dyeings on men's wear, crepes, sports flannels and tropical suitings; also several years association with commission dyeing trade doing tops, worsted skeins, cotton skeins, piece dyes, peroxide bleaching, naphthols, mohair plushes and imitation caracul cloths. Familiar with many types of machines. 38 years old, single with dependents. References.

B-11

Education—B.T.C., Lowell Textile Institute, 1926.

Experience—1 year dyeing wool raw stock with chrome colors, 6 years dyeing hosiery on all fiber combinations and cotton, wool and merino yarns in Franklin Process machines, several years experience in garment dyeing. Age 29. Married. References.

F-1

Education—Textile Institute, Alexander Hamilton Inst., Extension work at Brown Univ., working knowledge of German.

Experience—Has had executive departmental work with all types of textiles manufacturers. Acquainted with all types of textile machinery, dyestuff application, laboratory practice, cost methods, and checking methods and processes. References.

DEVELOPED COLORS APPLIED TO COTTON

(This tabulation relates to the use of 1 lb. of dyestuff per 100 lbs. of cotton *only*.)

	ABSORPTION RATE The quantity absorbed in the minutes indicated compared with that absorbed when applied by the Standard Strength Method					*Affinity at different temperatures in relation to the affinity when applied by the Standard Strength Method.*			
Dyestuff Name	2 *Min.*	5 *Min.*	15 *Min.*	30 *Min.*	45 *Min.*	70-80°F.	120°F.	160°F.	1 *lb. Standard Strength Dyeing*
Pontamine Diazo									
Yellow 2GL (Pat.)	75	85	90	100	100	30	90	100	100
Pontamine Diazo									
Orange	100	100	100	100	100	60	125	125	100
Orange G (Pat.)	75	85	100	100	100	55	85	95	100
Orange 3G (Pat.)	75	90	95	100	100	80	100	100	100
Orange 2R (Pat.)	60	75	95	100	100	35	75	95	100
Orange WD (Pat.)	50	55	65	80	100	40	55	55	100
Pontamine Diazo									
Brown 6G	40	55	80	90	100	45	55	65	100
Brown R (Pat.)	55	75	85	100	100	45	75	90	100
Du Pont									
Primuline Conc.	70	75	80	90	100	50	75	90	100
Pontamine Diazo									
Bordeaux 7B	85	90	90	95	100	80	100	100	100
Red 5BL	65	85	95	100	100	10	40	90	100
Red 7BL	75	80	85	90	100	75	110	100	100
Scarlet *A*	90	95	100	100	100	90	95	100	100
Scarlet 2BL	55	75	95	100	100	10	30	85	100
Scarlet R	90	100	100	100	100	90	100	100	100
Pontamine Diazo									
Violet BL (Pat.)	55	75	90	100	100	30	45	85	100
Violet RR (Pat.)	70	85	90	100	100	60	80	90	100
Pontamine Diazo									
Blue BR	50	65	70	100	100	30	60	80	100
Blue 3G (Pat.)	45	55	75	85	100	25	60	85	100
Blue 6G	65	70	75	85	100	30	100	100	100
Blue 5GL	60	80	100	100	100	20	60	90	100
Blue NA	40	60	80	100	100	25	60	85	100
Blue 6RN	45	65	80	100	100	35	60	85	100
Pontamine Diazo									
Green BL (P.A.F.)	35	45	60	85	100	20	35	55	100
Green 3G	40	60	80	90	100	10	45	70	100
Green 2GL	50	65	70	90	100	10	40	70	100
Green GW (P.A.F.)	35	45	70	85	100	5	10	45	100
Developed Black									
VG	70	85	100	100	100	55	80	100	100
Pontamine Diazo									
Black BHSW Conc.	60	80	100	100	100	50	70	80	100
Black 2BN	60	65	70	85	100	35	60	80	100
Black RS	60	70	85	95	100	40	60	70	100
Black ZV Conc.	60	70	75	90	100	40	80	85	100

DIRECT COLORS APPLIED TO COTTON

(This tabulation relates to the use of 1 lb. of dyestuff per 100 lbs. of cotton *only*.)

	ABSORPTION RATE — *The quantity absorbed in the minutes indicated compared with that absorbed when applied by the Standard Strength Method*					*Affinity at different temperatures in relation to the affinity when applied by the Standard Strength Method.*			
Dyestuff Name	2 *Min.*	5 *Min.*	15 *Min.*	30 *Min.*	45 *Min.*	70-80°F.	120°F.	160°F.	1 *lb. Standard Strength Dyeing*
Du Pont									
Stilbene Yellow G Conc.	50	55	65	95	100	70	90	95	100
Thioflavine S	65	80	90	100	100	10	60	80	100
Pontamine									
Fast Yellow L2RX	55	60	65	90	100	75	85	90	100
Fast Yellow L3RX	50	55	75	100	100	90	95	100	100
Fast Yellow WBF	65	70	90	95	100	50	80	90	100
Pure Yellow M	70	75	90	100	100	35	100	100	100
Yellow CG	90	100	100	100	100	25	80	100	100
Yellow CH	85	90	95	95	100	90	100	100	100
Yellow SX	35	40	50	100	100	90	95	95	100
Yellow SXG	65	70	80	100	100	60	110	100	100
Yellow SXR	25	50	80	90	100	50	90	100	100
Pontamine									
Fast Orange EG	50	55	60	75	100	65	85	100	100
Fast Orange 2 G Conc. (Pat.)	60	65	85	90	100	40	55	80	100
Fast Orange MGL	45	50	55	80	100	60	80	90	100
Fast Orange MRL	30	40	50	80	100	60	80	85	100
Fast Orange 7R	45	50	70	85	100	60	70	75	100
Pontamine									
Fast Orange *S*	90	100	100	100	100	45	100	100	100
Fast Orange WS	75	85	100	100	100	50	110	110	100
Orange DB	85	90	100	100	100	30	80	90	100
Orange F	75	80	85	90	100	20	50	100	100
Orange R	100	100	100	100	100	90	100	100	100
Du Pont									
Rayon Brown G	80	90	95	100	100	75	100	100	100
Rayon Brown M	75	80	85	90	100	70	85	85	100
Pontamine									
Brown BT Conc.	85	90	100	100	100	65	85	100	100
Brown CG	70	100	100	100	100	35	60	85	100
Brown CR	70	80	90	95	100	35	75	80	100
Brown D3GN	35	55	70	85	100	10	15	45	100
Brown NCR	35	55	85	90	100	20	30	55	100
Brown N3G	75	100	100	100	100	40	70	100	100
Brown RG	65	70	75	85	100	45	65	70	100
Brown RMR	85	90	95	100	100	75	90	100	100
Brown T2G	80	90	100	100	100	30	70	100	100
Brown XR	50	60	80	90	100	10	30	55	100
Catechu B	50	60	70	80	100	40	60	70	100
Catechu G Conc.	80	85	90	100	100	50	80	90	100
Catechu 3G	85	90	95	100	100	60	90	100	100
Catechu GN	80	90	100	100	100	50	85	90	100

DIRECT COLORS APPLIED TO COTTON—Continued

(This tabulation relates to the use of 1 lb. of dyestuff per 100 lbs. of cotton *only*.)

Dyestuff Name	*ABSORPTION RATE* The quantity absorbed in the minutes indicated compared with that absorbed when applied by the Standard Strength Method					*Affinity at different temperatures in relation to the affinity when applied by the Standard Strength Method.* 1 lb. Standard Strength Dyeing			
	2 Min.	5 Min.	15 Min.	30 Min.	45 Min.	70-80°F.	120°F.	160°F.	
Du Pont									
Congo Red	80	90	100	100	100	45	85	100	100
Purpurine 4B Conc.	60	80	90	100	100	35	90	100	100
Purpurine 10B	75	85	90	95	100	70	80	90	100
Rayon Bordeaux B (Pat.)	70	70	70	85	100	100	100	100	100
Pontamine									
Bordeaux B	80	80	95	100	100	35	80	100	100
Fast Pink EB Extra	70	75	80	90	100	110	105	100	100
Fast Pink EBN	80	90	100	100	100	90	100	100	100
Fast Pink G	90	100	100	100	100	80	110	90	100
Fast Pink GGN	65	80	90	100	100	80	90	100	100
Fast Red F	85	90	90	90	100	45	95	100	100
Fast Red FCB	90	100	100	100	100	45	100	100	100
Fast Scarlet 4BA	40	50	75	100	100	15	55	80	100
Fast Scarlet 4BS	55	65	85	100	100	20	60	90	100
Fast Scarlet 8BS	55	70	85	100	100	35	55	90	100
Fast Scarlet G	50	60	85	100	100	20	50	90	100
Garnet R	80	80	90	100	100	50	85	100	100
Pink 2B	80	85	90	95	100	100	100	100	100
Red 12B Conc.	75	80	90	100	100	50	75	90	100
Scarlet B	50	55	70	85	100	70	85	70	100
Scarlet 6BX	55	60	65	80	100	60	80	105	100
Du Pont									
Rayon Violet 3 B (Pat.)	80	90	100	100	100	65	85	110	100
Rayon Violet 4R (Pat.)	80	85	85	95	100	100	110	100	100
Pontamine									
Brilliant Violet B	70	85	90	100	100	70	90	100	100
Brilliant Violet RN	60	85	90	95	100	85	120	110	100
Fast Heliotrope B	85	90	95	100	100	90	100	100	100
Violet N	55	70	90	100	100	50	85	90	100
Violet NW	70	80	100	100	100	55	90	100	100
Du Pont									
Rayon Navy Blue N (Pat.)	70	90	100	100	100	80	100	100	100
Pontamine									
Blue AX	45	65	95	100	100	15	40	100	100
Blue AXN	60	75	95	100	100	20	50	100	100
Blue BB Supra Conc.	50	65	75	90	100	90	125	110	100
Blue BBF	65	80	85	95	100	80	110	100	100
Blue BX	65	90	100	100	100	70	90	110	100
Blue 3BX	65	90	95	100	100	70	90	100	100
Blue CLG	80	90	95	100	100	80	100	100	100
Blue GH Conc.	45	65	80	90	100	40	60	75	100

DIRECT COLORS APPLIED TO COTTON—Continued

(This tabulation relates to the use of 1 lb. of dyestuff per 100 lbs. of cotton *only*.)

Dyestuff Name	*ABSORPTION RATE — The quantity absorbed in the minutes indicated compared with that absorbed when applied by the Standard Strength Method*					*Affinity at different temperatures in relation to the affinity when applied by the Standard Strength Method. 1 lb. Standard Strength Dyeing*			
	2 *Min.*	5 *Min.*	15 *Min.*	30 *Min.*	45 *Min.*	70-80°F.	120°F.	160°F.	
Pontamine									
Blue 3R	65	70	80	95	100	65	70	100	100
Blue RW	45	65	85	100	100	10	15	90	100
Brilliant Blue G	50	70	90	100	100	90	125	100	100
Copper Blue RRX	80	85	100	100	100	50	70	100	100
Fast Blue 6G	30	55	65	80	100	55	80	100	100
Fast Blue RX	60	75	85	90	100	40	75	100	100
Navy Blue DB	60	80	85	100	100	40	70	70	100
Sky Blue 6B	70	85	90	100	100	80	100	100	100
Sky Blue 5BX	55	70	85	95	100	60	85	90	100
Sky Blue FF	60	80	85	90	100	70	80	90	100
Steel Blue G	65	80	90	100	100	70	85	100	100
Du Pont									
Rayon Green 4B	65	85	90	100	100	30	100	100	100
Pontamine									
Brilliant Green GX	85	90	100	100	100	80	115	110	100
Green BX	70	80	95	100	100	25	35	85	100
Green 2GB Extra	90	100	100	100	100	35	55	100	100
Green GX	80	90	100	100	100	50	70	95	100
Green S Conc.	85	100	100	100	100	45	85	100	100
Green 2Y	85	95	100	100	100	35	65	95	100
Pontamine									
Fast Gray B	80	85	90	100	100	60	85	100	100
Direct Fast Black LR	85	90	95	100	100	105	110	100	100
Du Pont									
Rayon Black B	70	80	90	100	100	40	60	80	100
Pontamine									
Black E Double	60	80	85	90	100	35	60	80	100
Black EBN	60	70	80	90	100	35	55	80	100
Black 3G	70	90	100	100	100	35	80	100	100
Black RR	65	75	90	90	100	30	45	80	100
Black RX	60	85	90	90	100	35	65	85	100
Fast Black FF	70	90	95	100	100	35	70	100	100
Fast Black GCW	70	80	100	100	100	40	60	90	100
Fast Black L	80	80	90	90	100	100	110	100	100
Fast Black PG Extra	55	65	85	90	100	15	30	65	100

FAST-TO-LIGHT DIRECT COLORS APPLIED TO COTTON

(This tabulation relates to the use of 1 lb. of dyestuff per 100 lbs. of cotton *only*.)

	ABSORPTION RATE The quantity absorbed in the minutes indicated compared with that absorbed when applied by the Standard Strength Method					*Affinity at different temperatures in relation to the affinity when applied by the Standard Strength Method.* 1 lb. Standard Strength Dyeing			
Dyestuff Name	2 Min.	5 Min.	15 Min.	30 Min.	45 Min.	70-80°F.	120°F.	160°F.	
Pontamine Fast									
Yellow BBL	60	75	80	100	100	30	70	90	100
*Yellow 4GL	85	90	100	100	100	85	120	100	100
*Yellow 5GL	85	90	100	100	100	85	120	100	100
Yellow NNL	70	90	100	100	100	20	80	90	100
Yellow RL	70	85	90	100	100	75	110	105	100
Orange EGL	80	90	100	100	100	70	100	105	100
Orange ERL	60	80	90	100	100	60	100	100	100
Orange 2GL (Pat.)	85	100	100	100	100	40	100	105	100
Orange MGL	45	55	75	90	100	45	70	90	100
Orange MRL	35	55	75	90	100	45	75	90	100
Orange RGL (Pat.)	80	85	90	95	100	25	45	90	100
Brown 4GL (Pat.)	60	70	80	90	100	15	30	100	100
Brown RKL	70	80	90	100	100	70	100	100	100
Brown RL	40	60	80	90	100	30	50	70	100
Brown 2RL (Pat.)	80	90	100	100	100	30	80	100	100
Brown 4RL	40	50	80	100	100	10	40	85	100
Brown 3YL	90	100	100	100	100	50	80	110	100
Bordeaux BL	60	80	100	100	100	40	70	90	100
Pink BL	40	60	80	90	100	40	75	100	100
Red 6BL	50	70	90	100	100	— 5	30	90	100
Red 8BL	80	90	100	100	100	60	110	105	100
Red 8BNL	30	50	70	85	100	— 5	—10	50	100
Violet 4BL	70	85	100	100	100	40	70	100	100
Violet SRL	60	70	80	90	100	30	80	90	100
Blue 2GL	60	80	90	100	100	50	90	100	100
Blue 4GL	60	70	90	100	100	40	80	90	100
Blue 8GL (Pat.)	45	60	80	90	100	40	60	100	100
Blue RRL	60	75	90	100	100	20	80	110	100
Blue SFL	50	70	85	100	100	40	70	85	100
Blue SL	50	60	85	95	100	30	70	105	100
Blue SRL	70	90	100	100	100	20	70	100	100
*Green GL	25	35	55	80	100	— 5	20	60	100
Grey BL (Pat.)	40	50	80	90	100	20	50	85	100
Grey 2GL (Pat.)	60	75	90	100	100	50	90	100	100
Black L	80	90	100	100	100	90	100	110	100

* The results obtained in duplicate sets of dyeings are not consistent. As reflected in the dyeings of the yellows it appears due to their sensitiveness to slight variations in the pH of the dye baths and hardness in the water. No explanation for the cause with the green is available at this time.

— Indicates that less than quantity mentioned is absorbed.

CALENDAR OF COMING EVENTS
Meeting, South Central Section, Chattanooga, Tenn., Jan. 20th.
Election of Officers

DEVELOPED COLORS APPLIED TO RAYON

(This tabulation relates to the use of 1 lb. of dyestuff per 100 lbs. of rayon *only*.)

	ABSORPTION RATE — *The quantity absorbed in the minutes indicated compared with that absorbed in 45 minutes at 180°-190° F.*					*Affinity at different temperatures in relation to the affinity at 180°-190° F.*				
Dyestuff Name	2 *Min.*	5 *Min.*	15 *Min.*	30 *Min.*	45 *Min.*	70°-80° *F.*	120° *F.*	160° *F.*	180°-190° *F.*	*Without Glauber's Salt* 180°-190° *F.*
Pontamine Diazo										
Yellow 2GL (Pat.)	30	40	80	95	100	15	70	95	100	60
Pontamine Diazo										
Orange	60	80	100	100	100	60	110	115	100	80
Orange G (Pat.)	35	45	80	90	100	20	75	90	100	80
Orange 3G (Pat.)	35	45	85	100	100	20	75	90	100	70
Orange 2R (Pat.)	15	30	55	80	100	5	30	80	100	45
Orange WD (Pat.)	25	35	75	90	100	25	70	80	100	60
Pontamine Diazo										
Brown 6G	*									
Brown R (Pat.)	10	25	55	75	100	5	30	80	100	45
Du Pont										
Primuline Conc.	35	60	80	95	100	35	120	110	100	35
Pontamine Diazo										
Bordeaux 7B	30	45	90	100	100	40	110	100	100	75
Red 5BL	15	30	80	90	100	5	30	80	100	65
Red 7BL	45	50	90	100	100	20	110	110	100	65
Scarlet A	45	55	90	100	100	105	120	100	100	65
Scarlet 2BL	20	30	70	90	100	5	35	85	100	70
Scarlet R	50	60	100	100	100	90	110	100	100	65
Pontamine Diazo										
Violet BL (Pat.)	10	20	50	75	100	— 5	20	80	100	60
Violet RR (Pat.)	15	35	65	85	100	5	45	85	100	50
Pontamine Diazo										
Blue BR	20	30	60	80	100	— 5	40	90	100	20
Blue 3G (Pat.)	20	30	70	90	100	— 5	60	100	100	20
Blue 6G	60	70	80	100	100	10	75	80	100	15
Blue 5GL	10	20	55	100	100	— 5	15	90	100	15
Blue NA	10	25	80	90	100	5	30	80	100	25
Blue 6RN	20	35	90	95	100	5	55	90	100	25
Pontamine Diazo										
Green BL (P.A.F.)	5	10	25	55	100	— 5	10	35	100	15
Green 3G	10	30	45	90	100	— 5	30	60	100	40
Green 2GL	10	30	60	80	100	— 5	15	35	100	70
Green GW (P.A.F.)	5	10	30	80	100	— 5	10	40	100	25
Developed Black VG	30	40	90	100	100	10	50	100	100	65
Pontamine Diazo										
Black BHSW Conc.	10	45	85	90	100	10	45	75	100	60
Black 2BN	25	55	70	90	100	25	55	85	100	45
Black RS	15	30	70	80	100	15	65	85	100	55
Black ZV Conc.	25	35	75	90	100	— 5	50	100	100	65

* Too weak tinctorially to be economical for application to rayon.

DIRECT COLORS APPLIED TO RAYON

(This tabulation relates to the use of 1 lb. of dyestuff per 100 lbs. of rayon *only*.)

	ABSORPTION RATE The quantity absorbed in the minutes indicated compared with that absorbed in 45 minutes at 180°-190° F.					*Affinity at different temperatures in relation to the affinity at 180°-190° F.*				
Dyestuff Name	2 *Min.*	5 *Min.*	15 *Min.*	30 *Min.*	45 *Min.*	70°-80° F.	120° F.	160° F.	180°-190° F.	*Without Glauber's Salt* 180°-190° F.
Du Pont										
Stilbene Yellow G Conc.	*									
Thioflavine S	35	55	70	90	100	— 5	50	80	100	85
Pontamine										
Fast Yellow L2RX	*									
Fast Yellow L3RX	*									
Fast Yellow WBF	15	35	55	75	100	—10	55	95	100	50
Pure Yellow M	30	45	55	75	100	15	65	80	100	50
Yellow CG	65	80	90	100	100	—10	55	90	100	65
Yellow CH	55	80	90	95	100	160	190	185	100	55
Yellow SX	*									
Yellow SXG	*									
Yellow SXR	*									
Pontamine										
Fast Orange EG	30**	40	80	90	100	40	70	100	100	15
Fast Orange 2 G Conc. (Pat.)	15	20	60	85	100	5	10	40	100	50
Fast Orange 7R	*									
Fast Orange S	30	50	75	90	100	20	100	100	100	75
Fast Orange WS	30	60	80	100	100	20	75	100	100	60
Orange DB	40	55	70	85	100	20	70	90	100	75
Orange F	35	50	75	90	100	15	90	100	100	55
Orange R	50	75	90	100	100	30	100	105	100	80
Du Pont										
Rayon Brown G	65	70	80	90	100	100	130	120	100	40
Rayon Brown M	50	100	100	100	100	100	125	115	100	50
Pontamine										
Brown BT Conc.	25	40	60	80	100	15	50	60	100	60
Brown CG	60	70	90	100	100	15	30	80	100	70
Brown CR	40	55	80	100	100	30	60	70	100	50
Brown D3GN	30	55	70	85	100	—10	40	85	100	60
Brown NCR	20	50	70	85	100	—10	10	40	100	50
Brown N3G	35	60	80	90	100	—10	50	80	100	80
Brown RG	45	65	80	90	100	50	85	90	100	60
Brown RMR	40	60	80	90	100	30	80	100	100	80
Brown T2G	40	60	75	90	100	10	70	90	100	70
Brown XR	30	55	75	85	100	— 5	15	55	100	40
Catechu B	50	70	85	100	100	20	60	75	100	70
Catechu G Conc.	40	60	70	80	100	25	70	95	100	60
Catechu 3G	55	75	90	95	100	40	90	100	100	65
Catechu GN	70	80	90	100	100	30	80	90	100	65

* Too weak tinctorially to be economical for application to rayon.
** Relatively weak tinctorially.

DIRECT COLORS APPLIED TO RAYON—Continued

(This tabulation relates to the use of 1 lb. of dyestuff per 100 lbs. of rayon *only*.)

	ABSORPTION RATE The quantity absorbed in the minutes indicated compared with that absorbed in 45 minutes at 180°-190° F.					*Affinity at different temperatures in relation to the affinity at 180°-190° F.*				
Dyestuff Name	2 *Min.*	5 *Min.*	15 *Min.*	30 *Min.*	45 *Min.*	70°-80° F.	120° F.	160° F.	180°-190° F..	*Without Glauber's Salt* 180°-190° F.
Du Pont										
Congo Red	45	70	90	100	100	10	90	95	100	65
Purpurine 4B Conc.	30	45	85	100	100	5	50	90	100	55
Purpurine 10B	30	50	80	100	100	10	65	90	100	65
Rayon Bordeaux B (Pat.)	45	90	95	100	100	100	116	165	100	65
Pontamine										
Bordeaux B	40	55	65	90	100	20	100	100	100	65
Fast Pink EB Extra	20	30	35	70	100	75	115	90	100	35
Fast Pink EBN	25	30	35	75	100	85	150	140	100	50
Fast Pink G	40	90	100	100	100	85	150	130	100	55
Fast Pink GGN	40	50	55	55	100	90	115	125	100	30
Fast Red F	60	75	90	95	100	30	110	100	100	50
Fast Red FCB	60	75	90	95	100	30	95	95	100	65
Fast Scarlet 4BA	10	25	45	75	100	—10	35	75	100	50
Fast Scarlet 4BS	15	30	55	80	100	—10	35	80	100	50
Fast Scarlet 8BS	15	25	55	80	100	—10	35	80	100	35
Fast Scarlet G	15	20	40	80	100	5	25	45	100	45
Garnet R	30	45	60	70	100	10	60	100	100	60
Pink 2B	30	35	45	75	100	55	90	70	100	30
Red 12B Conc.	60	70	80	90	100	65	140	110	100	50
Scarlet B	40	50	65	80	100	90	150	120	100	50
Scarlet 6BX	80	90	95	100	100	165	180	165	100	40
Du Pont										
Rayon Violet 3B (Pat.)	35	55	80	100	100	10	75	100	100	65
Rayon Violet 4R (Pat.)	55	85	95	100	100	35	135	100	100	65
Pontamine										
Brilliant Violet B	35	60	80	95	100	35	120	110	100	35
Brilliant Violet RN	35	60	75	85	100	35	140	110	100	20
Fast Heliotrope B	55	95	100	100	100	100	150	115	100	65
Violet N	35	55	85	100	100	20	80	100	100	50
Violet NW	35	55	85	100	100	20	75	115	100	35
Du Pont										
Rayon Navy Blue N (Pat.)	65	90	95	100	100	50	115	115	100	65
Pontamine										
Blue AX	25	35	80	95	100	— 5	15	85	100	50
Blue AXN	15	35	80	90	100	— 5	20	80	100	65
Blue BB Supra Conc.	20	50	60	100	100	45	120	110	100	25
Blue BBF	35	60	80	90	100	60	110	110	100	25
Blue BX	15	30	60	75	100	15	55	100	100	60
Blue 3BX	20	25	60	95	100	40	95	110	100	30
Blue CLG	20	35	75	90	100	25	80	100	100	50
Blue GH Conc.	10	15	35	70	100	15	55	85	100	25
Blue 3R	15	25	60	80	100	30	100	100	100	20
Blue RW	10	35	55	80	100	5	35	80	100	50

DIRECT COLORS APPLIED TO RAYON—Continued

(This tabulation relates to the use of 1 lb. of dyestuff per 100 lbs. of cotton *only*.)

	ABSORPTION RATE The quantity absorbed in the minutes indicated compared with that absorbed in 45 minutes at 180°-190° F.					*Affinity at different temperatures in relation to the affinity at 180°-190° F.*				
Dyestuff Name	2 Min.	5 Min.	15 Min.	30 Min.	45 Min.	70°-80° F.	120° F.	160° F.	180°-190° F.	Without Glauber's Salt 180°-190° F.
Pontamine										
Brilliant Blue G	10	15	35	60	100	35	100	100	100	15
Copper Blue RRX	15	40	60	100	100	15	55	100	100	75
Fast Blue 6G (Pat.)	20	40	60	80	100	40	75	80	100	25
Fast Blue RX	20	40	60	80	100	5	60	75	100	25
Navy Blue DB	15	35	60	80	100	15	80	100	100	45
Sky Blue 6B	20	25	55	80	100	40	90	90	100	25
Sky Blue 5BX	15	25	60	80	100	50	100	100	100	25
Sky Blue FF	15	35	65	80	100	50	90	90	100	30
Steel Blue G	35	45	75	90	100	45	90	90	100	50
Du Pont										
Rayon Green 4B	60	85	95	100	100	20	120	140	100	35
Pontamine										
Brilliant Green GX	70	80	95	100	100	70	140	100	100	65
Green BX	35	60	80	100	100	15	90	100	100	65
Green 2GB Extra	45	65	90	100	100	5	30	90	100	85
Green GX	50	65	85	95	100	20	70	135	100	75
Green S Conc.	55	70	90	100	100	20	70	130	100	65
Green 2Y	55	70	90	100	100	20	70	100	100	65
Pontamine										
Fast Gray B	25	45	100	100	100	— 5	35	85	100	55
Direct Fast Black LR	90	95	100	100	100	100	145	115	100	60
Du Pont										
Rayon Black B	35	60	80	100	100	—10	40	70	100	65
Pontamine										
Black E Dbl.	30	35	45	70	100	5	30	55	100	80
Black EBN	50	60	75	100	100	15	55	80	100	75
Black 3G	55	70	80	95	100	15	70	90	100	70
Black RR	55	70	80	95	100	5	35	90	100	75
Black RX	45	65	85	100	100	5	45	95	100	70
Fast Black FF	45	65	80	100	100	5	45	100	100	65
Fast Black GCW	50	65	90	100	100	5	50	100	100	65
Fast Black PG Extra	35	55	70	90	100	10	45	75	100	60

FAST-TO-LIGHT DIRECT COLORS APPLIED TO RAYON

(This tabulation relates to the use of 1 lb. of dyestuff per 100 lbs. of cotton *only*.)

	ABSORPTION RATE The quantity absorbed in the minutes indicated compared with that absorbed in 45 minutes at 180°-190° F.					*Affinity at different temperatures in relation to the affinity at 180°-190° F.*				
Dyestuff Name	2 Min.	5 Min.	15 Min.	30 Min.	45 Min.	70°-80° F.	120° F.	160° F.	180°-190° F.	Without Glauber's Salt 180°-190° F.
Pontamine Fast										
Yellow BBL	35	55	80	100	100	5	25	70	100	35

FAST-TO-LIGHT DIRECT COLORS APPLIED TO RAYON—Continued

(This tabulation relates to the use of 1 lb. of dyestuff per 100 lbs. of cotton *only*.)

	ABSORPTION RATE — *The quantity absorbed in the minutes indicated compared with that absorbed in 45 minutes at 180°-190° F.*					*Affinity at different temperatures in relation to the affinity at 180°-190° F.*				
Dyestuff Name	2 *Min.*	5 *Min.*	15 *Min.*	30 *Min.*	45 *Min.*	70°-80° *F.*	120° *F.*	160° *F.*	180°-190° *F.*	*Without Glauber's Salt* 180°-190° *F.*
Pontamine Fast										
Yellow 4GL	85	95	100	100	100	35	120	110	100	40
Yellow 5GL	65	85	100	100	100	15	80	85	100	40
Yellow NNL	25	35	55	75	100	10	35	75	100	30
Yellow RL	25	40	70	95	100	15	60	80	100	5
Orange EGL	35	45	85	100	100	15	55	75	100	10
Orange ERL	35	55	75	100	100	20	60	80	100	5
Orange 2GL (Pat.)	45	70	95	100	100	20	70	100	100	50
*Orange MGL										
*Orange MRL										
Orange RGL (Pat.)	35	50	75	90	100	5	30	70	100	35
Brown 4GL (Pat.)	30	35	55	100	100	15	25	55	100	45
Brown RKL	45	75	90	95	100	45	100	100	100	10
Brown RL	25	30	45	65	100	10	25	45	100	10
Brown 2RL (Pat.)	15	30	45	80	100	10	30	65	100	20
Brown 4RL	15	25	40	80	100	5	10	35	100	15
Brown 3YL	50	90	100	100	100	15	65	90	100	55
Bordeaux BL	35	55	85	100	100	8	45	85	100	20
Pink BL	20	25	65	85	100	15	40	90	100	5
Red 6BL	15	20	45	70	100	5	30	70	100	10
Red 8BL	15	40	65	85	100	8	100	100	100	25
Red 8BNL	15	35	70	90	100	5	10	60	100	40
Violet 4BL	25	60	70	80	100	20	60	80	100	20
Violet SRL	45	60	80	100	100	30	80	90	100	10
Blue 2GL	15	35	55	75	100	5	35	55	100	5
Blue 4GL	15	35	60	75	100	5	35	60	100	15
Blue 8GL (Pat.)	15	25	55	100	100	5	20	45	100	5
Blue RRL	20	30	70	100	100	5	30	70	100	10
Blue SFL	10	35	50	70	100	5	35	45	100	10
Blue SL	15	35	45	60	100	5	30	60	100	10
Blue SRL	15	55	80	85	100	10	60	80	100	10
Green GL	10	25	60	100	100	5	10	55	100	5
Gray BL	10	20	40	55	100	10	30	40	100	5
Gray 2GL	25	35	65	95	100	15	55	80	100	5
Black L	60	90	90	95	100	80	100	100	100	30

*The dyeings of both these dyestuffs are very weak tinctorially when applied to rayon.

Proceedings of the American Association of Textile Chemists and Colorists

UNEMPLOYMENT REGISTER

Members of this association, who are without employment, should forward to the secretary a statement as to their qualifications and experience. This information will subsequently appear on these pages with an identifying key number. Employers are also requested to file with the secretary any vacancies which may occur in their businesses.—A. Newton Graves, Secretary, care Franklin Process Company, Providence, R. I.

Key: A—Laboratory and research; B—Dyeing or printing; C—Finishing; D—Sales; E—Instruction; F—Executive

NOTE. Persons who have obtained employment should notify the secretary at once. Prospective employers may file vacancies either with the secretary or the AMERICAN DYESTUFF REPORTER.

A-2

Education—B.T.C., Lowell Textile Institute, 1932; also course in shorthand and typing.

Experience—None to date, interested in quantitative analysis, experimental dyeing, color matching, dye testing and dye identification. Ability to learn quickly and will go anywhere. 23 years old, single.

A-5

Education—B.T.C., Lowell Textile Institute.

Experience—Assistant chemist in carpet mill, dye tester in dye plant, research and analytical work in silk dyeing and finishing plant laboratory, plant chemist and overseer of bleaching in surgical dressing plant, assistant chemist in woolen mill. Age 29. Married.

A-B-2

Education—Lowell Evening Textile School, 1917.

Experience—Five years' experience in hosiery dyeing, full fashioned hosiery of silk and cotton and silk, also men's hosiery containing rayon, wool, cotton and celanese. Several years experience in laboratory work. Has also had experience in jig-dyeing of cotton piece goods, slub and top dyeing.

A-E-2

Education—B.T.C., Lowell Textile Institute, 1933.

Experience—Assistant instructor in chemistry, Lowell Textile Institute. Member of scholastic honorary fraternity.

A-B-C-1

Education—Graduate Industrial Chemical Engineer, Pratt Institute—1911.

Experience—One year as plant control chemist, 4 years as laboratory chemist with gas company, 13 years as plant chemist with bleaching, dyeing and finishing plant. (Rayon and cotton piece goods). Formulated processes and put them into plant operation, 1 year as chemist and demonstrator for dyestuff company, 1 year as superintendent colorist with print works printing linen and rayon, 1 year as director of testing laboratory for national dry goods concern.

A-B-E-1

Education—B.S. in chemistry at C.C.N.Y. Working now on M.A. at Columbia.

Experience—7 years as dye tester and color matcher for dye manufacturer; 6 months skein silk and rayon dyer; 4 years textile chemist and dyer for cotton finishing concern; 2 months boss bleacher and 4 years as teacher of organic chemistry and dyeing. Age 38, single.

A-E-1

Education—Ph.D., Univ. of Illinois, studied chemical engineering at Columbia, licensed chemical engineer, New Jersey.

Experience—10 years' experience teaching in colleges, subjects included chemical and textile subjects. Has had broad experience in industrial work including experience in testing materials, research and consulting. Will go anywhere; references.

B-1

Education—Educated and trained in chemistry and calico printing in Glasgow, Scotland.

Experience—Has been with large print works as colorist for 13 years producing first class work on cotton, rayon, wool and silk fabrics. References.

B-2

Experience—Boss dyer with one firm for 18 years, divisional supt. at print works for 1 year, in charge of processing and dyeing of cottons and rayons at large bleachery for 6 years. Prefers bleachery in East but will go anywhere. References.

B-3

Experience—Foreman piece dyer for the past 21 years. Can dye the following; celanese, rayon, cotton backs, wool, silk and mixed fabrics. Has knowledge of finishing and laboratory work.

B-6

Education—Graduate R. I. School of Design.

Experience—5 years in bleachery, 7½ years as assistant dyer, 2 years as boss dyer and 3 years as superintendent of dyeing and finishing. Married, 33 years old. References.

B-7

Experience—4 years as assistant to manager in ribbon mill; 2 years as boss dyer on veils, chiffons and silk skeins; 5 years as boss dyer on ribbons and skeins (cotton and silk); 7 years as boss dyer on spun silk (pure dye and fast) resisted colors; last 12 years as hosiery dyer on silk and cotton, silk-cotton, rayon or wool. 50 years old, married. References.

B-8

Education—Chemistry and Dyeing Department, Philadelphia Textile School.

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AMERICAN
DYESTUFF
REPORTER

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Published biweekly by
HOWES PUBLISHING CO., INC.
440 Fourth Avenue, New York City

A. P. HOWES, President
M. D. REESER, Secretary
H. F. CRAWFORD, Treasurer

Subscription price: $5.00 per year; Canadian $6.80; foreign $6.00

Vol. XXIII January 1, 1934 No. 1

THE NEW YEAR AND CAPITAL GOODS

A YEAR ago, in a New Year's message, we expressed the hope and belief that 1933 would see improvement in economic conditions.

The first few months of the year made this prediction seem doubtful of accomplishment but since the end of the banking holiday last Spring, conditions have unquestionably improved.

Reviewing all the developments of the last twelve months and endeavoring to assess their influence for good or ill, we feel safe in asserting that the worst of the current depression is definitely over and that although recovery may not be so speedy as we should like, the trend of economic conditions during the coming year will unquestionably be upward.

Only a few weeks since, the nation was greatly excited over the possibility of unrestrained inflation. Recent published statements of the President and those in his confidence, however, have made it clear that real inflation is certainly not contemplated in the immediate future. There is, of course, always the possibility that such a course will ultimately be forced upon the Government through failure of national credit, but such a contingency cannot possibly occur in the immediate future.

It is obvious that the Government will utilize all possible measures short of actual currency inflation as stimuli for general business. The means now receiving most serious attention from Government financial experts and one, incidentally, which has wide general popularity is the increase of expenditure for capital goods.

There has been considerable expansion in certain consumer lines owing to the activities of the N. R. A. and other causes but so far capital goods lines—that is, machinery and equipment which are used in the manufacture of other goods or in the performance of public services—have lagged markedly. Thus, railroad equipment buying has been virtually at a standstill for several years, building construction has been at a minimum, hydro-electric and oil development projects have remained in the blueprint stage.

It is now the professed intention of the Government to use every effort to stimulate production of goods falling in these categories. Probably the means to this end most widely used will be direct loans from the R. F. C. to permit the purchase of capital goods by those corporations which are actually in need of them.

Probably no type of expenditure does more to improve general business than expenditures for capital goods, for they mean additional employment of labor by all of the concerns who supply such products and, once the products themselves are delivered, they require added labor to keep them in service.

It is felt that R. F. C. loans made for this purpose will not constitute a direct expansion of national debt as they will be, in large part, covered by the obligations of the corporations which receive the loans so that in reality the expansion in credit will be that of the individual manufacturing concerns rather than of the National Government. This is a most important feature to consider with relation to the condition of the national credit.

It seems to us that there is an opportunity for everyone who has influence of any kind with industry to urge upon industry the desirability of increasing expenditures for capital goods at this time in order to stimulate employment and accelerate the velocity of money. If everyone who has influence will urge wherever possible increased spending of this character, with recourse to the Government for loans where necessary, a tremendous volume of business should result within the next six or eight months.

After all is said and done, our present troubles are largely psychological. If all owners of wealth could be persuaded overnight that there were no cause for alarm, a very different picture would result within twenty-four hours. Nothing reassures wealth like current profitable business activity and even though this activity may be artificially stimulated, it is our opinion that within a very short time the appearance of activity will result in an actual return of confidence and, consequently, of sound business conditions.

Let us all make up our minds to face 1934 with the conviction that we are on the upward road, to encourage confidence in ourselves and in others and thus to assist in making 1934 a Very Happy New Year.

A. P. H.

Washington News Letter

Cosmetic Regulation Inspired by Proprietary Dyes

By WALDON FAWCETT

IT IS an open secret at Washington that the proposed revision and extension of the Federal food and drugs statutes has been instigated by growing official resentment against certain proprietary dyes for personal use. Thereby is brought to a head a controversial issue that has been the subject of considerable discussion for some years past. There is, however, this deviation, that whereas previous debate has centered largely upon the preparation for dyeing the hair of the head the current revolt, expressed in the drastic Tugwell Bill, has been precipitated in consequence of the allegedly dangerous propreties of certain concoctions supposedly for use in dyeing eyebrows and eyelashes.

The Copeland-Sirovich Bill, authorship of which is usually attributed to Assistant Secretary of Agriculture Tugwell, expands the existing basic law of 1906 in various directions. Most notably, though, by inclusion of cosmetics. The present law is wholly without jurisdiction over cosmetics except in those rare instances when the labeling bears medicinal claims. With the extensive development in recent years of toilet goods, porclaimed as efficacious for a wide variety of uses, there has come, from time to time more or less agitation for revision of the Food and Drugs Act to encompass cosmetics, etc.

Confessedly it has been the methods of advertising a number of the supposedly harmless toilet aids that have been mainly responsible for the present move to police cosmetics and, particularly, for the penalties upon deceptive advertising proposed in the Tugwell Bill. In several conspicuous instances within the past year or two, tragic occurrences have resulted from the unwitting use of products containing highly dangerous ingredients though advertised and labeled as entirely harmless.

Perhaps the new policy at the Department was provoked at the outset by the observation of the officials of the U. S. Food and Drug Administration of the consequences of the use of the depilatory known as "Koremlu Cream." This product, represented as entirely harmless and actually beneficial to the skin, was found by the Department chemists to contain a highly poisonous chemical —thallium acetate. The records of the Department show that its widespread utilization for the removal of superfluous hair caused many cases of severe injury to users before the manufacturer was forced into bankruptcy by accumulation of damage suits. Following upon this initial offender came cumulative transgressions by hair dyes, etc., which gave the actual urge for the Tugwell draft which encompasses as "cosmetics" all substances and preparations intended for cleansing or altering the appearance of or promoting the attractiveness of the person.

The attack on dye-culprits was led by W. G. Campbell, Chief of the U. S. Food and Drug Administration, when he a few weeks ago made his first expose of "Lash-Lure," an eyelash dye manufactured by Lash-Lure, Inc., Los Angeles, California. Chief Campbell told the press that his organization had investigated the case of a prominent clubwoman in Dayton, Ohio, who was made totally blind as a result of an application made by a beauty parlor operator using "this highly poisonous cosmetic." He quoted the American Medical Association as stating that Lash-Lure contains "an aniline dye which is extremely corrosive and capable of burning away the outer coating of the eyes." In a "newsreel" talk, released to motion picture theatres, Assistant Secretary Tugwell accompanied a visualization of a laboratory test by a Department scientist with the comment: "He finds that this cosmetic contains a coal-tar dye that is extremely poisonous to some people. This explains why women who use this stuff are having the outer coatings of their eyeballs burned off and are becoming blind as a result. Such products ought not to be sold. Manufacturers should be compelled to put only honest, safe products on the market and in their advertising they should represent them truthfully."

Dr. Campbell and his associates, incident to their routine analyses to determine the curative or therapeutic effects of drug products, have investigated a number of specialties in which dyes, etc., play a part. Thus there has been scrutiny of preparations such as Mrs. Potter's Walnut Tint Hair Stain and Simplex Hair Coloring. This type of preparations are alleged by the Department to contain Paraphenylene-Diamine and this ingredient, it is charged, may produce violent local dermatitis. In citing Notox and other indicted examples, the officials assert that the criticized element may be absorbed by a habitual user, causing general weakness, stomach disorders, dizziness, double vision, asthmatic attacks, etc. Comment is added that France, Germany and Austria long ago prohibited the use fo paraphenylene-diamine but that manufacturers there do not hesitate to export it to America where it is widely used as an ingredient of hair dyes.

In the class of hair dyes containing lead, the Depart-

(Continued on page 29)

THE SCIENTIFIC ASPECT OF MILLING

(Continued from page 4)

Some time ago Speakman and Stott (J. Text. Inst., 1931, *22*, 339) designed special apparatus to measure the frictional resistance to motion of wool fibers in the direction of the root-end, and in the direction of the tip. It was considered that the observed difference in friction would constitute a measure of the degree of scaliness of the wool and also of the effectiveness of the scales in causing shrinkage during milling. This apparatus is shown in Fig. 1 and consists essentially of a base board A to which is hinged at H a strip of Board B. The slant of strip B can be adjusted to any angle Θ by tightening or slackening the cord S which passes over a pulley wheel P. Secured to strip B is a layer C of special pile wool fabric and on this rests a wood block D which carries specially arranged wool fibers and which is more clearly shown in Fig. 2. Referring to Fig. 2 it may be noted that F represents upwards of fifty wool fibers arranged parallel to each other and with their scales pointing in the same direction; they are fastened to the base board A by means of shellac and are just maintained taut by means of the strips B and C.

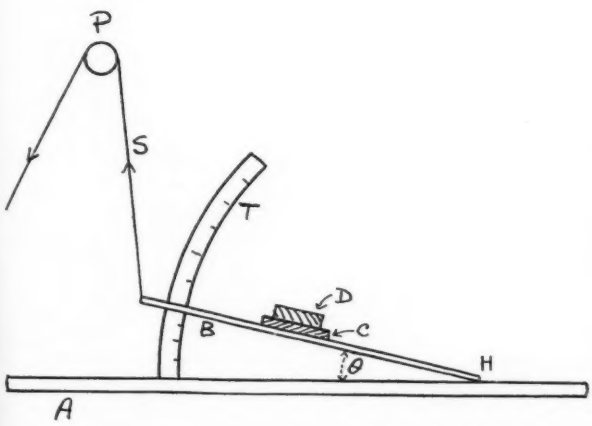

Fig. 1—Apparatus for determining the scaliness of wool fibers.

The pile fabric C was a face cloth having a trial pile finish and was considered as the nearest attainable equivalent of a surface consisting of wool fibers aligned parallel to each other.

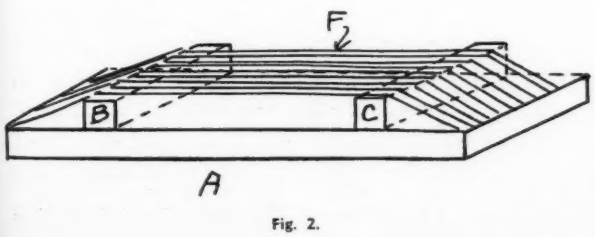

Fig. 2.

In the experiments, the block D is first placed on the top of surface C so that the scales of the fifty fibers point either away or towards the hinge H and so that the fibers themselves are in contact with the surface C. The slant of strip B is then increased until the block D commences to slip; the angle of slope (slip) is then noted, say Θ_1. Then the direction of the fibers is reversed and the angle of slip again determined in a similar manner, say Θ_2. In this manner the angles of slip Θ_1 and Θ_2 are obtained when the fibers are sliding with the scales favoring and opposing motion respectively. Precautions are taken to obtain reliable results and to avoid discrepancies arising from any unevenness in the surface of C. Under such circumstances it was discovered that the following relationship obtained:

$$\text{Percentage difference in friction} = \frac{(\tan \Theta_2 - \Theta_1)}{\tan \Theta_1} \times 100$$

and that this per cent friction was independent of any load which may be placed on block D for the purpose of pressing it closely on surface C.

In this manner the following results were obtained and they are particularly interesting:

Wool	*% Difference in Friction*	*Average Fiber Diameter (μ Units)*
Tasmanian Super-quality Merino	50.0	16.1
90's Australian Merino	42.9	17.4
80's Australian Merino	60.4	17.7
80's Cape Merino	52.0	18.3
70's Cape Merino	59.4	19.0
70's Cape Merino	60.0	19.4
64's Cape Merino	52.0	20.8
64's Cape Merino	44.3	21.4
70's Australian Merino	39.8	22.0
64's Australian Merino	44.0	23.0
60's Australian Merino	33.7	24.8
60's Australian Merino	35.0	27.4
Australian Merino	22.6	33.2
Southdown	28.3	32.8
Romney March	27.5	34.3
56's Southdown	25.7	31.7
Corriedale	25.2	23.8
Exmoor	23.5	40.9
Oxford Down	21.3	41.7
Wensleydale	16.3	36.8
Leicester	13.5	38.0
Mohair	5.0	31.7

It is at once evident that if the frictional difference is a reliable measure of the milling properties of a wool, then mohair should be much less suitable for milling than a Merino wool; this in fact is the case, and the value of the frictional difference factor appears substantiated. But it must be pointed out that in some earlier investigations by Speakman and Goodings (J. Text. Inst., 1926, *17*, 607) the milling properties of similar fabrics made from

Wensleydale, Oxford Down, and Southdown wools were compared with the following results:

Wool	*% Shrinkage in Milling*
Wensleydale	33.7
Oxford Down	28.0
Southdown	16.3

It is here noticed that the order of milling efficiency is exactly opposite to the order of scaliness as indicated by the frictional difference. Thus factors other than scaliness must in these instances be assumed to play a more important part.

Another feature worthy of note which is indicated by the table of frictional differences given above is that the degree of scaliness (per cent difference in friction) appears to decrease as the wool fiber becomes coarser. In fact it is shown in Fig. 3 that this relationship is nearly linear. Apparently the finer the fibers the greater is the friction between them when rubbed over each other with the scales pointing in opposite directions.

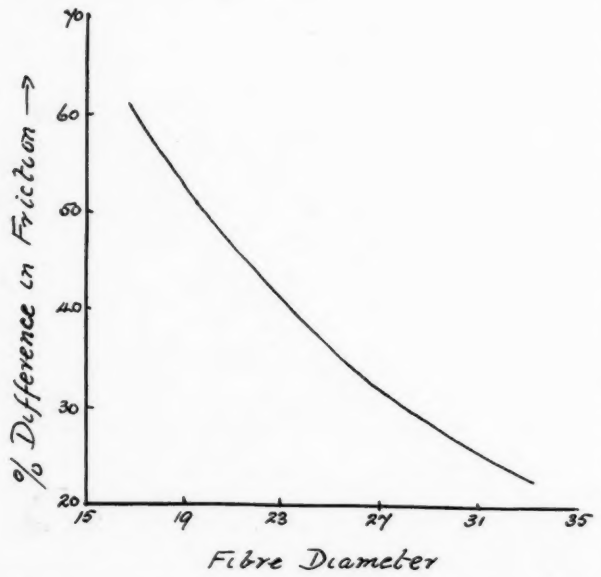

Fig. 3—Curve showing the relationship between fiber diameter and degree of scaliness.

Considering the results obtained as a whole it may be concluded that in comparing the milling properties of two types of wool which differ very widely as regards their scaliness (for example, Merino wool and mohair) it is likely that the dominating factor will be the degree of scaliness. But in dealing with wools having slightly differing degrees of scaliness then it is possible that scaliness may not be a reliable means for comparing their milling properties since its influence may be outweighed by other factors of more importance.

Quite recently Speakman, Stott, and Chang have investigated the scaliness of various wools in relation to their milling properties by a procedure similar to that described above except that contact between the parallel fibers and the fabric surface was made under water. But before dealing with these investigations it will be convenient to refer to a paper on the properties of wool fibers by S. A. Shorter (J. Soc. Dyers and Col., 1923, *39*, 270). Shorter has considered the milling process from both the practical and theoretical viewpoints and has put forward extremely interesting views to account for the manner in which wool fabric shrinks and felts during this process.

Milling is considered as primarily due to the fact that a wool fabric becomes, under suitable conditions of fiber contact (induced by moisture and still more by milling agents) a collection of self-tightening mechanisms, that is to say, mechanisms whereby the haphazard external forces acting on the fabric, are transformed so as to produce a consistently consolidating effect. The conditions of fiber contact are further considered to be largely affected by the scales on the wool fibers.

Shorter considers the behavior of a single wool fiber entangled in the midst of other fibers at two points along its length. It appears probable that these entanglements can be either of two classes:— (a) those in which the entanglement is so tight that no motion of the fiber is possible, and (2) those in which there is sufficient freedom for the fiber to move, relative to the entanglement, in the direction of the root end, that is, the direction which (as already pointed out) is favored by the presence of the scales. Entanglements of the first class need not be considered further since they allow of no increased consolidation. But in general, a fiber will have entanglements of the second class, and this demands further examination.

With regard to a fiber which at one point has an entanglement of class (1), that is, a point of complete or immovable entanglement, and which at another point has an entanglement of class (2), that is, a point of partial or movable entanglement, it is obvious that two conditions may exist. In the one condition (a), the scales on the fiber between the two entanglements point towards the point of complete entanglement, and in the other (b), the scales point towards the point of partial entanglement.

In case (a), any movement of the wool will cause the fiber to move so as to diminish the distance between the two entanglements. This effect is produced by the root end of the fiber retreating further into the point of movable entanglement, such retreat being favored by the scales and the direction in which they point. In this manner the two entanglements are drawn closer together and the wool material thereby shrinks or mills. This effect is permanent, for on withdrawal of the external forces causing movement of the wool material the scales prevent the root end of the fiber from being drawn out of the point of entanglement into which it has retreated. This action has been likened by Shorter to the effect of self-tightening

(Continued on page 29)

handcuffs which automatically tighten as the prisoner struggles.

In case (b), disturbance of the wool material will lead to an increase of length of fiber between the two entanglements since the direction in which the scales point allows a withdrawal of the fiber from the point of partial entanglement. If the fiber were a rigid rod this would tend to produce a local expansion of the fabric, but owing to lack of appreciable flexural rigidity of the fiber it merely loops and ultimately becomes entangled with other fibers.

Thus Shorter explains the milling process by reference to the two fundamental factors: (1) uni-directional freedom of motion of the fibers due to the surface scales and the direction in which they point, and (2) lack of appreciable flexural rigidity of the fiber.

As previously mentioned, milling of wool goods is carried out in an aqueous medium so that measurements of the frictional forces between wool fibers due to scaliness should be carried out in water and not when the wool is dry. It is well known of course that wool materials cannot be milled in the dry condition. Hence for the purpose of obtaining an explanation of the lack of agreement between the scaliness as found for Southdown, Oxford Down, and Wensleydale wools and their relative milling properties, Speakman, Stott, and Chang have recently repeated their measurements of scaliness under water (J. Text. Inst., 1933, *24*, *273*) instead of in air as hitherto. The results are as follows:

Type of Wool	*Scaliness*	*Fiber Diameter* (μ *Units*)
Tasmanian Super-quality Merino	119.5	17.0
Cape Merino 70's	69.5	19.3
Southdown 56's	56.2	29.0
Australian Merino 60's	49.1	24.7
Romney Marsh	47.3	32.2
Oxford Down	46.9	38.1
Corriedale	43.4	23.6
Leicester	42.9	33.6
Wensleydale	33.8	36.4
Mohair	15.7	37.0

An easily observable point emphasized by the above results is that the degree of scaliness of a wool fiber measured under water is much higher than when measured in air. Presumably this is due to the swelling of the fiber such that the scales become more deeply embedded in each other. The scaliness of the Tasmanian wool is surprisingly high. But more important is the fact that the scaliness of the Southdown, Oxford Down, and Wensleydale wools is in the same order with water as with air, and that this order is inverse to that indicated by their milling properties as found by practical experience and experiment. The conclusion must therefore be reached that milling properties are dependent on other factors than scaliness alone.

(To be concluded in the next issue)

WASHINGTON NEWS LETTER

(Continued from page 26)

ment is making examples of Hess Hair Milk, Wyeth's Sage and Sulphur Compound, "Color-Bak," put out by United Remedies, Inc., Parker's Hair Balsam, and Odell's Hair Color Restorer. As to consequences with this category, the Department declares that while lead is absorbed slowly it accumulates in the system resulting in chronic lead poisoning manifested by malnutrition, anemia, painful joints, abdominal tremors, and sometimes convulsions. It is remarked that local injury to skin and scalp may also result, as has been attested by a number of cases that have come under the notice of the Department.

Under fire in the Departmental campaign as guilty of containing silver or pyrogallol or both are Buckingham's Dye, Mary L. Goldman's Gray Hair Color Restorer, Kalochrom Hair Dye, Richmond Hair Dye, Triumph Hair Dye, B. Paul's Hair Coloring Mixture, Haywood's Nubian Hair Dye, and B. Paul's Liquid Mixture. By the Department diagnosis continued use of silver may cause argyrism, a permanent bluish-black discoloration of the skin and mucous membranes, produced by absorption of silver. As for pyrogallol which may also be absorbed, it is deemed capable of producing severe inflammation of the skin and in some instances acute kidney inflammation, difficult breathing, and even convulsions followed possibly by collapse and death.

The hair preparations that contain thallium acetate carry, by Departmental appraisal, potentialities of baldness, severe muscular pains, weakness, general nerve impairment and paralysis. Beaver's Hair Tonic and other carriers of mercury are represented as conveying risks to individuals highly suceptible to mercurial poisoning. Irritation or corrosion of the skin is instanced as the least of their perils. Strictures are likewise laid upon preparations exampled by Del-a-Tone and X-Bazin which are reputed to contain barium sulfide to which latter is imputed capability for corroding and injuring the skin.

Hearings conducted by a sub-committee of the United States Senate, preliminary to the rewriting in Committee of the Tugwell Bill, indicated that the burden of the opposition in industrial quarters is directed at the advertising provision and other revolutionary phases of the Bill rather than against the proposal to stretch jurisdiction to cosmetics. The impression at the Capitol is that if any general revision of the Regulatory statutes is enacted by this Congress it will provide for censorship of cosmetics. Meanwhile the Department indicates that it will continue, by every means in its power, to warn the public of the dangers involved in poisonous dye preparations.

Acquires Maryland Chemical Co.

The American Cyanamid & Chemical Corporation on December first acquired the Maryland Chemical Company, of Baltimore, Maryland, which, under the direction of Mr. Samuel M. Leidy, as Vice-President and General Manager, will be operated as a subsidiary of the American Cyanamid & Chemical Corporation. The Maryland Chemical Company specializes in the sale of Mineral Acids, Alkalies, Alums, Phosphates of Soda, Ammonia, Silicate of Soda, Glauber's Salt, and other chemicals, in the Baltimore territory, including Washington, D. C.

NEW PATENTS

(Abstracted by S.O.C.M.A.)

Water Soluble Derivatives of Indigoid Dyestuffs. (Comprises reacting upon suitable indigoid dyestuffs in anhydrous pyridine, with benzoic acid-m-sulfo-chloride; of particular value in dyeing and printing, as they may be easily reconverted into the original dyestuffs on the fiber.) Walter Mieg, Opladen, and Rudolf M. Heidenreich, Leverkusen-on-the-Rhine, Ger., assignors to General Aniline Wks., Inc., N. Y., N. Y., No. 1,933,993, Nov. 7, 1933.

Azodyestuff. (New water insoluble azodyestuffs which are obtainable from hydroxy-naphtho-carbazole carboxylic acid arylamides by coupling same with unsulfonated and uncarboxylated diazotized aromatic amines; when produced on the fiber, give reddish brown to black dyeings of satisfactory fastness properties.) Albert Schmelzer, Fritz Ballauf and Heinrich Hefner, Elberfeld, Ger., assignors to General Aniline Wks., Inc., N. Y., N. Y., No. 1,934,009, Nov. 7, 1933.

Carbocyanine Dyes and Method of Preparing Them. (Photo-sensitizing dyes, more specifically comprises condensing, under the influence of heat, a l-methylbenzothiazole alkyl-p-toluene sulfonate with a trialkyl ortho-propionate.) Leslie G. S. Brooker, Rochester, N. Y., assignor to Eastman Kodak Co., Rochester, N. Y., No. 1,934,657, Nov. 7, 1933.

Carbocyanine Dyes and Method of Preparing Them. (Photo-sensitizing dyes more specifically comprises condensing, under the influence of heat, a l-methylbenzothiazole alkyl-p-toluene-sulfonate with triethyl orthophenylacetate.) Leslie G. S. Brooker, Rochester, N. Y., assignor to Eastman Kodak Co., Rochester, N. Y., No. 1,934,658, Nov. 7, 1933.

Carbocyanine Dyes and Method of Preparing Them. (Photographic sensitizing dyes, a 2:2'-dialkyl-8-arylthiocarbocyanine salt in which the aryl radical belongs to the benzene series.) Leslie G. S. Brooker, Rochester, N. Y., assignor to Eastman Kodak Co., Rochester, N. Y., No. 1,934,659, Nov. 7, 1933.

Safranine Dyestuff Intermediates and Process of Preparing the Same. (Readily converted into dyestuffs of the safranine series yielding shades of greenish blue having excellent fastness properties to both light and washing; comprises condensing cresidine, with para-nitrochloro-benzene-ortho-sulfonic acid in the presence of an alkaline reacting substance.) Walter C. Meuly, Milwaukee, Wis., assignor, by mesne assignments, to E. I. du Pont de Nemours & Co., No. 1,934,727, Nov. 14, 1933.

Vat Dyestuffs of the Anthraquinone Series and a Process of Preparing Them. (More specifically, comprises condensing l-amino-anthraquinone with 4.4'-diphenyl-ether-dicarboxylic acid chloride by heating the components in the presence of nitrobenzene.) Johann Rosenbach, Wiesbaden, and Willy Lassman, Frankfort-on-the-Main, Ger., assignors to General Aniline Works, Inc., N. Y., N. Y., No. 1,934,771, Nov. 14, 1933.

BOOK REVIEW

Handbook of Chemistry and Physics. 18th Edition. Chemical Rubber Co., Cleveland, Ohio. p. 1818.

The new edition of the Handbook of Chemistry and Physics not only involves a revision of previous material but in addition several pages of new material have been added.

One of the noteworthy revisions is that of the table of Physical Constants of Inorganic Compounds. This table has been completely revised and nearly a thousand new compounds have been added. The metal-organic compounds have been segregated into a separate group following the main table; there is also a new and complete solubility chart as well as many other important additions and revisions. The editor and publisher of this handbook are to be commended for having made available such a useful and complete reference manual. No chemical library should be without it.

CLASSIFIED

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

Two wooden Vat Machines for neutralizing and finishing mercerized yarns, equipped with copper steam pipe, monel metal propeller and shaft. Each tub to be complete with yarn racks having monel bolts and fittings, and each machine to have two sets of sticks. Machines of 125 lb. capacity each handling 54" skeins of yarn sized from 24 to 70 single and 2 ply, the batches from mercerizer to weigh 42 lbs. each, three batches to be accumulated to go through the neutralizing and finishing baths. Write Box No. 798, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.